ASSESSING THE FOOD AND NUTRITION DESIRES AND NEEDS OF FOOD PANTRY GUESTS AGED 50 YEARS AND OLDER

By

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ASSESSING THE FOOD AND NUTRITION DESIRES AND NEEDS OF FOOD PANTRY GUESTS AGED 50 YEARS AND OLDER

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Abstract: Food insecurity can affect one's overall health physically, socially, and mentally. Our Daily Bread Food and Resource Center guest, 50 years of age and older were surveyed to assess food security, nutrition status, health, and educational preferences and desires. Comparisons were made between participants 50-64 years of age (pre-seniors) and participants 65 years of age and older (seniors). A seven-page survey was administrated to the food pantry guest. Overall, 119 participants participated, 59 pre-seniors and 60 seniors. The majority were female; Caucasian; divorced, separated, or widowed; unemployed; and from Stillwater. The majority had a high school diploma or less and annual income less than $12,000. Overall, 63% were food insecure. The majority reported the food received from the food pantry helped them to continue to live home. The majority reported having very few to no friends or family to help them. A large percentage reported consuming less than the lowest recommended intake of fruits and vegetables. Related to health, a descent percent of diseases were reported including high blood pressure, arthritis, dental problems, fatigue, depression, and diabetes. Overall, few individuals showed a positive interest for food and nutrition education programs. The most popular time for an educational session was approximately 30 minutes in length, early on a weekday. Educational aspects most desired were recipes, handouts, and food demonstrations. The top educational topics participants were interested in were how to utilize their financial resources to live a healthier lives and nutrition information related to disease. More research is needed to be able to extrapolate the data and indicate whether this population is representative of more of Oklahoma.

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CHAPTER I

INTRODUCTION

Food insecurity is a state of not having a reliable quality and quantity of nutritious foods (Strickhouser, Wright & Donley, 2015). Studies have shown food insecurity can increase the risk of various micronutrient deficiencies that can lead to numerous disease states (Jung & Frongillo Jr, 2001; Rose & Oliveira, 1997). Food insecurity has been shown not only to affect physical health but also mental and cognitive health (Vizuete, Robles, Rodríguez-Rodríguez, López-Sobaler & Ortega, 2010; Muldoon, Duff, Fielden & Anema, 2013).

Unfortunately, many Americans in all age groups face the consequential issue of food insecurity. As the Baby Boomer population ages, there will need to be an increased focus on the elderly population as one prediction is by 2050, over 25% of the population will be 60 years or older (Goldberg & Mawn, 2015).

Not only is food insecurity a significant problem nationwide but Oklahoma is one of the top ten food insecure states in America (Regional Food Bank of Oklahoma [RFBO], n.d.a). In Oklahoma approximately 656,000 individuals, (17%) are food insecure (RFBO, n.d.a). Furthermore, in Oklahoma one in six older adults, 60 plus years of age, are struggling with hunger (RFBO. n.d.a). Overall, food insecurity and hunger are negatively affecting the elderly population.

Assisting the elderly population will impact society as a whole. Almost a fifth of elderly individuals in Oklahoma are caring for children in their homes (RFBO, n.d.a). Studies have shown that elderly individuals with lower educational status are at higher risk for food insecurity (Strickhouser et al., 2015). Potentially since these individuals have completed less formal

education then those who are food secure, this lack of knowledge could contribute to thoughts of inadequacy and lack of confidence (Contento, 2016; Strickhouser et al., 2015). Self-efficacy is essential for individuals to initiate and be able to complete a task (Contento, 2016). Helping build self-esteem and confidence is key to individuals making healthier lifestyle changes. Educational sessions empower individuals to make more informed and discerning judgements on the best ways in handling money and healthy eating. Nutrition education is one way to assist the older population, which will also have an impact on the upcoming generations.

Food insecurity has been associated with higher medical bills (Keith-Jennings, 2018). Adequate nutrition can help decrease medical cost by decreasing length of stay in hospitals and overall health. Various nutrition programs have been shown to help with overall nutrition in the elderly. Overall, there are a variety of resources focused on the food insecure elderly population including the Older American Act Nutrition Program and the Senior Farmers Markets (Kamp, Wellman, & Russell, 2010). Nevertheless, more efforts are needed to assist in the healthy aging process. Having inadequate amounts of nutritious foods can exacerbate disease states and increase the cost of medical care. Another study looking at Supplemental Nutrition Assistance Program (SNAP) participants and low-income non-participants found that on average SNAP participants pay around $1,400 less every year for medical care (Carlson & Keith-Jennings, 2018).

Investing resources to determine food insecure older adult's nutritional needs may have a positive effect on numerous parts of our society. Following assessment, the knowledge gained could help improve individuals' physical and mental health and allow individuals to contribute more to future generations (Muldoon, Duff, Fielden, & Anema, 2013). Assessing the needs and desires of the older adult population at risk of food insecurity could greatly enhance the educational materials developed and implemented in counties throughout Oklahoma and potentially throughout the nation.

Purpose:

The purpose of this project was to:

1. Assess the food and nutrition desires and needs of Our Daily Bread Food and Resource Center food pantry clients who are 50 years of age and older, and to compare pre-seniors (50 to 64 years of age) with seniors (65 years of age and above).
2. In addition, this project aimed to identify educational preferences related to:
    a. Format and structure of educational materials.
    b. Subject matter that was of specific interest.
    c. Length of sessions, particular days, time of day, and amount of sessions for one specific topic.

Implications

1. Knowledge gained will assist community educators and food pantries to better serve the growing older population (pre-seniors and seniors).
2. Insights gained will help in development of food and nutrition education programs specifically targeting low-income older adults.

Assumptions

1. The participants did provide honest feedback to the survey questions.

Limitations

1. There was a limited sample size of older adults.

2. The study participants were from around the Stillwater area of Oklahoma and do not represent the older adult population in all parts of Oklahoma.

3. Memory and bias from the participants taking the survey may have altered results.

4. This study was conducted with a convenience sample, which decreased the likelihood of the sample representing the population correctly.

CHAPTER II

LITERATURE REVIEW

Defining Food Insecurity

The United States Department of Agriculture (USDA) defines food insecurity households have uncertainty or are unable to acquire enough food to meet the nutritional needs of the household for an active healthy life style(United States Department of Agriculture [USDA] Economic Research Service [ERS], 2018). . This definition indicates it is crucial for individuals to have access to sufficient quantity of nutritious food for a healthy lifestyle. Nutritionally dense food is of significant importance especially among the elderly population. One study looking at women, preschoolers, and elderly populations indicated the strongest correlation between food insufficiency and nutrient deficiency was within the elderly population (Jung & Frongillo, 2001).

Consequences of Food Insecurity

Overall diet quality and quantity are important factors in the aging process and help delay onset or even prevent some disease states (Kamp et al., 2010). Those who have low food security are 40% more likely to be diagnosed with a chronic disease (Keith-Jennings, 2018). One study reported that food insecure seniors were 2.33 times more likely to report being in fair or poor health than food secure seniors (Jung & Frongillo 2001). This indicates that overall health is decreased in relation to food insecurity. Deficiency of micronutrients and macronutrients from inadequate dietary intake affect one's overall health and physical condition. Various studies show that many essential nutrients are significantly lower among food insecure elderly versus food

secure elderly (Jung & Frongillo, 2001; Rose & Oliveira, 1997). Food insecurity has effects that impact one's physical condition such as hunger, malnutrition, and wasting (Muldoon, Duff, Fielden & Anema, 2013).

The elderly population often has various health conditions that often require numerous medications (Kamp et al., 2010). One study looking at the NHANES data from 1999-2004 reported 20.8% of those 65+ years of age were diagnosed with hypertension (McDonald, Hertz, Unger & Lustik, 2009). According to the Centers for Disease Control and Prevention, in 2015 almost half (48.3%) of those 65 years or older were prediabetic (Centers for Disease Control and Prevention, n.d.). Polypharmacy, which is taking multiple medications, for multiple health conditions is a risk factor for malnutrition and may affect specific nutrient interactions within the body (Kamp et al., 2010). A study with over 600 participants over the age of 60 reported those with the highest food insecurity had the highest cost-related medication non-adherence (Sattler & Lee, 2013). Thus, food insecurity can greatly impact health care effectiveness especially when individuals are unable to afford medication or to decrease their medication dosage.

A diet with adequate levels of essential nutrients is one action for a healthy lifestyle and in preventing disease. One study showed the energy intake of food insecure elderly was around two-thirds of the RDA and another study showed energy intake was less than 60% of the RDA. These studies show that many food insecure elderly have a significant need for increased calories (Jung & Frongillo, 2001; Rose & Oliveira, 1997). Reports showed that intake of ten essential nutrients was lower in food insecure elderly versus the food secure individuals; some of these nutrients were vitamin B6, B1, B2, iron, and calcium (Gundersen & Ziliak, 2014; Jung & Frongillo Jr, 2001; Rose & Oliveira, 1997). Decreased cognitive ability can decrease quality of life and some studies have shown a link between low levels of B vitamins and increased oxidative stress resulting in decreased cognitive function (Vizuete et al., 2010). This emphasizes the importance of micronutrients on overall cognitive health.

Micronutrient deficiency can lead to many issues that have short and long-term consequences. Osteoporosis has a positive association with low-income older adults who are more likely to have inadequate dietary intakes (Lyles, Schafer, & Seligman, 2014). This indicates that food insecurity not only has immediate ramifications but also long-term consequences with chronic disease states.

Other health outcomes that are higher among food insecure seniors in comparison to food secure seniors are 53% increased incidence of heart attacks, twice the rate of asthma, and 40% greater likelihood of having congestive heart failure (Gundersen & Ziliak, 2014). These numbers indicate higher chances of non-communicable diseases with food insecure adults. Food insecure individuals may have higher chances of various diseases versus food secure.

Some disease states that are related to food insecurity include obesity, hypertension, and diabetes (Muldoon et al., 2013; Seligman, Laraia, & Kushel, 2010). In looking at NHANES data of low-income individuals, there was a positive association between hypertension and high levels of hemoglobin A1c (Seligman et al., 2010). One study looking at the weight of older adults actually indicated an inverse relationship between food insecurity and weight for older men (Hernandez, Reesor, & Murillo, 2017). However, the same study showed a positive correlation between obesity rates and food insecurity among women (Hernandez et al., 2017). Another study using the Behavioral Risk Factor Surveillance System of 2009 looked at obesity rates with food security and insecurity among age groups (Pan, Sherry, Njai, & Blanck, 2012). The results indicated a positive correlation between food insecurity and obesity. The survey showed that one in every three individuals is food insecure. Among those above the age of 50 there is around an 11% prevalence of obesity which have higher rates among food insecure versus food secure (Pan et al., 2012).

Mental health consequences can be another impact of food insufficiency. Poor mental health issues can include higher levels of stress, anxiety, social isolation, and depression. One study found those who were food insufficient, in addition to being hungry, were 1.69 times more likely to experience mental illness than those who were only food insufficient. A large percentage (28.48%) of food insecure individuals also faces mental illness in addition to food insecurity (Muldoon et al., 2013). Another study using NHANES data with validated survey instruments also found a high correlation between food insecurity and depression (Leung, Epel, Willett, Rimm, & Laraia, 2015). After adjustments for other lifestyle factors, adults with very low food security (not having adequate food so an individual in a household experiences hunger) were three times more likely to have depression than food-secure adults. In this study the most common depressive symptoms reported for those with food security issues were "1) feeling tired or having little energy; 2) trouble sleeping or sleeping too much; and 3) feeling down, depressed, or hopeless" (Leung et al. 2015, p. 624). After controlling for other risk factors, food insecure seniors were 60% more likely to have depression (Gundersen, & Ziliak, 2014). One can see how lack of intake can increase lethargy and issues with sleeping that have a ripple effect which impacts one's mood. Lack of energy may perpetuate the problem of food insecurity since individuals may have lack of energy to even prepare a meal.

Food Insecurity in Adult and Older Adult Population

The elderly population in America is growing as the Baby Boomer population ages (Colby & Ortman, 2014). By 2050, estimates are that a fifth of the population will be 65 years or older (Feeding America and American Association of Retired Persons [AARP] Foundation, 2015). In 2000, only 16.3% of the U.S. population was 60 years of age or older; however, by 2050 the prediction is 25.5% of the U.S. population will be 60 years or older (Goldberg & Mawn, 2015).

In addition, the incidence of food insecurity among the elderly population has also increased over the years and is a major public health concern. Between the years of 2001 to 2011, the number of food insecure seniors doubled (Gundersen & Ziliak, 2014). The percentage of food insecure senior households has continued to increase since the early 2000s (NCOA, n.d). In 2015, around 8.3% of senior adult households were food insecure (National Council on Aging, n.d). Though efforts are enacted to combat food insecurity in this population, as the population continues to increase, more intentional initiatives are required.

Though there are numerous programs assisting the elderly, funding for these programs is inadequate to assist the growing population. Not only is the growing elderly population a factor but inflation has continued to increase, and one study suggested that since 1970s the funding for federal programs has not kept pace with the needs (Kamp, et al., 2010).

Another report showed the funds attributed to community programs were highly effective and beneficial compared to the cost of spending one day in the hospital. In comparing the OAA Nutrition program cost for a whole year versus the cost of hospitalization for one day, the cost was similar. Though the cost is similar, the program's effectiveness overtime in assisting the older population in healthy lifestyles outweighs the repeated cost of a single day in a hospital (Kamp, et al., 2010).

Those over 60 years of age are not the only adults facing food insecurity. One analysis of over 55 million Americans, 40 years of age and above, found significant food insecurity among people aged 40-49 (Strickhouser et al., 2015). One study looking at rural Texans above the age of 50 found a higher percentage of individuals 50-59 years of age said that they sometimes or often experience food insecurity in comparison to Texans 60 years and older (Jiang et al., 2011). These results emphasize the importance of not forgetting about adults under the age of 60 who are food insecure. The current study targeted individuals who were 50 years and above. This review

indicates that despite the fact that seniors are a vulnerable population; they are not the only population with significant issues of food insecurity.

Programs such as the Senior Farmer's Market Nutrition Program, Congregate Meals, and Commodity Supplemental Food Program are specifically designed for those 60 years and above (Feeding America and AARP Foundation, 2015). Adults below 60 years are also challenged by food insecurity and issues reentering the job market or finding a new job when they are laid off from work or let go. As these individuals are ineligible for many programs, this increases the risk of food insecurity among this population (Feeding America and AARP Foundation, 2015).

Risk Factors for Food Insecurity

There are specific trends in considering who is more likely to be food insecure. Numerous factors put adults at higher risk for food insecurity such as lower socio-economic status (Strickhouser et al., 2015). Among ethnicities, African-Americans have a higher rate of food insecurity followed by Hispanics and Caucasians (Strickhouser et al., 2015). The trend of minorities having higher prevalence of food insecurity may be in part because of poverty; for example, Asians are increasingly having higher rates of poverty (DeNavas-Walt, Proctor, & Smith, 2010). Though there are limited studies among Asian American, one study noted that food insecurity may be higher than perceived depending on the different sub-groups of Asian American (Becerra, Mshigeni & Becerra, 2018)

Another population group that has been shown to have higher food insecurity is immigrants (Muldoon et al., 2013). Immigrants may have difficulties getting settled, finding jobs, and lacking social support system which could increase their chances of food insecurity. Immigrants are typically in the minority which is of increased risk for food insecurity.

There are many factors that influence the likelihood of food insecurity including education, marriage, gender, and employment status. Educational status and food insecurity have been shown to have an inverse relationship (Strickhouser et al., 2015). Another factor associated with increased food insecurity is decreased time for food related activities (Jablonski, McFadden, & Colpaart, 2016). The unemployed have significantly higher rates of food insecurity (Strickhouser et al., 2015). Marital status has also been shown to impact food insecurity. Individuals who are widowed, divorced, or separated are at higher risk for food insecurity. In comparing genders, females have a slightly higher risk of food insecurity than males (Strickhouser et al., 2015). This could be due to the fact that there is an income disparity between males and females which could increase their risk for food insecurity.

Both age and having children at home can influence food insecurity in the elderly population. Among the Oklahoma elderly population trying to provide food for themselves, almost a fifth (19%) are also responsible for providing food for their grandchildren (RFBO, n.d.a). Research shows that food insecurity was more prevalent among those 62 years or above who had children in the home (Brucker, & Coleman-Jensen, 2017). Another report indicated that seniors with children were almost three times more likely to be also facing food insecurity (Gundersen & Ziliak, 2014). In comparison, adults between the ages of 18-61 who had children in the home had lower levels of food insecurity (Brucker, & Coleman-Jensen, 2017).

Disabilities have been associated with increased risk of food insecurity (Brucker, & Coleman-Jensen, 2017). Among those in the working adult population, those with disability had some of the highest rates for food insecurity. There are various types of disabilities and among the elderly; those with mental disabilities had the highest rates of food insecurity (Brucker, & Coleman-Jensen, 2017). The only disability in this study that showed a positive relationship to food security was hearing impairment (Brucker, & Coleman-Jensen, 2017). Disabilities that impact the elderly can include functional limitations. Food insecure seniors have more limitations to

activities of daily living than those who are food secure (Ziliak, Gundersen & Haist, 2014). One review indicated among the elderly population being marginally food insecure is similar to being 14 years older than their present age (Ziliak et al., 2014). Since food insecurity is correlated with a decreased ability to perform activities of daily living such as preparing food, those with food insecurity tend to act significantly older.

Research shows lack of access to food, whether that is because of transportation or financial resources, is related to food insecurity. One study reported the majority of individuals (88%) use their own vehicle to go to the grocery store; however, only 70% of food insecure individuals owned a vehicle. Not only is having access an issue but the finances needed to purchase food is a significant issue. Some research shows low income individuals commonly spend over a third of their income (36%) on food (Jablonski et al., 2016).

Environment and geographical location are also risk factors to consider in regards to food insecurity. Research shows that rural communities have less access to fruits and vegetables than urban communities (Jablonski et al., 2016).

Rural is defined as at the community level having a population of 2,500 or less (Taylor & Whitecre, 2017). Whereas “non-metropolitan” is a county without any of the cities having a population more than 50,000 people. Payne County is considered a micropolitan county meaning it has a community with over 10,000 people (Taylor & Whitecre, 2017).

Food insecurity affects people all across America and a higher prevalence is observed in the southern U.S. (Strickhouser et al., 2015; Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017). One of the potential reasons why the south is experiencing more food insecurity could be in part to being more rural.

When implementing ideas to assist those with food insecurity, assessing the community structure is integral. One study reported older adults’ interpersonal relations including individuals’ social

networking and their physical environment, were significant factors affecting their health behaviors (Sahyoun, Pratt, & Anderson, 2004). A study conducted with over 1000 participants indicated those with low levels of community social capital were four times more likely to report "often being food insecure" than those considered to have moderate levels of community social capital (Jiang et al., 2011). Social capital is membership or belonging to a group and a respectful understanding and exchanging of ideas (Bourdieu, 1986).

Overview of Oklahoma

Food insecurity affects the nation but specifically many individuals in Oklahoma. Oklahoma has been reported to be in the top ten states for food insecurity (Regional Food Bank of Oklahoma [RFBO], n.d.a). Approximately 656,000 Oklahomans or 17% are food insecure. One in every six Oklahomans seniors is facing hunger. In 2018, around 18.1% of those aged 60 or older were estimated to face hunger in Oklahoma (United Health Foundation, 2018).

Coping Mechanisms

Those who are facing food insecurity may attempt numerous coping mechanisms. Research shows 83% of food insecure households used more than three different coping mechanisms within the past twelve months. People attempted to cope by reaching out to friends and family for assistance, buying less expensive foods high in calories, fat, and sugar, watering down food and/or drinks, and selling personal items for money (RFBO, n.d.a).

Despite the fact that there are two main food banks in Oklahoma, those who receive assistance from these food banks are facing challenges in many areas of their lives including making daily decisions of whether or not they will be able to buy food or pay bills. One conservative estimate suggested that one in 11 elderly individuals make the choice whether to buy food or pay for medicine or medical care (Hunger Free Oklahoma, n.d.). Of the clients that are assisted by the

Regional Food Bank of Oklahoma, 63% have medical bills and 56% are choosing between paying for food or housing (RFBO, n.d.a). Not only are food insecure people in Oklahoma challenged to pay their bills but also with the low prevalence of health insurance and the many health problems that occur with food insecurity, these individuals have actually been shown to sometimes incur significantly higher medical costs (Putnam, 2015). A study looking at NHANES data from the early 2000s found that food insecure adults had a lower percentage with medical insurance that excluded Medicare and Medicaid and they had higher Medicare and Medicaid participation (Seligman et al., 2010). Food insecure individuals have higher health care expenses because they are around 50% more likely to visit the emergency room, to be admitted into a hospital, and have longer hospital stays than individuals who are food-secure (Keith-Jennings, 2018). One study found food insecure people spent around 45% more on medical costs annually in comparison to food-secure households (Keith-Jennings, 2018).

Not being able to afford insurance while having many medical issues is a difficult issue for some with food insecurity. Medicare is a federal health insurance program that primarily assists those who are 65 years or older (Medicare.gov, n.d.). Part A which is free for most older adults helps cover hospital stays, skilled nursing facilities, hospice care and some health care. Medicare is not available to those under the age of 65 years of age unless they have disabilities or have end-stage renal disease. Over 49 million people, which is around 15% of the population, are enrolled in Medicare (AARP Public Policy Institute, 2012). In 2016, among non-elderly individuals, Oklahoma saw uninsured rates greater than 12% which is in the top 12 states in the nation (Kaiser Family Foundation, 2017) Overall, this high level of uninsured working age adults ages 50-64 years could lead to increased stress and difficulty managing and preventing disease in this population. Medicaid is eligible for adults if they meet the required income requirement, citizenship or have disability (Medicaid.gov n.d.).

Food Assistance Programs

Many national government and private organizations try to assist the elderly population to acquire proper nutrition throughout the aging process. One program is the Older American Act (OAA) Nutrition Program. OAA is the largest national food and nutrition program targeting older adults. The OAA assists less than a third of individuals who are in need of services (Kamp, et al., 2010). The OAA Nutrition program assists by giving grants to states to serve individuals 60 years and over. Two of the big initiatives of OAA are helping with congregate meals and home-delivered meals. OAA nutrition programs assist with meeting nutritional and social needs at the congregate meal sites (Administration for Community Living, n.d.).

Home-delivered meals may be partially paid for by OAA. Home-delivered meals not only provide nutritious meals for the elderly population but also help with social interaction and the older adult's ability to stay in their homes. The food not only provides nutrition but also allows the individuals to have a social network, which improves quality of life and overall health, plus enables them to live at home. Home-delivered meals are a national program that looks different in different locations. If an individual is unable to pay, the program will allow them to receive meals. In a 2017 Oklahoma report, over 27,000 meals were provided to seniors which included home-delivered and congregate meals (Meals on Wheels America [MOWA], n.d.a; MOWA, n.d. b).

Another program on the national level is Feeding America, the largest domestic hunger-relief organization in the U.S. (Jablonski et al., 2016). In 2016, Feeding America provided over four billion meals to those facing hunger. Feeding America is trying to prevent food waste through partnering with manufacturers, distributors, and foodservice companies and to help provide nutrient rich foods to those in need (Feeding America, n.d.a).

Another large non-profit organization targeting the elderly population is the National Foundation to End Senior Hunger (NFESH). This organization has been seen working in the research, education and with community partners to help elevate the growing problem of hunger in the senior population (Gundersen & Ziliak, 2014). This organization assists with increasing awareness of the hunger that many seniors are facing.

The Senior Farmers' Market Nutrition Program (SFMNP) is another federal government program assisting low-income seniors 60 years of age and above. Native Americans at or above age 55 are allowed to participate in Oklahoma (Oklahoma Department of Human Services [ODHS], 2017). This program helps individuals who are financially in need to be able to obtain unprocessed, fresh, and nutritious local fruits and vegetables from farmers' markets (United States Department of Agriculture [USDA] Food and Nutrition Service [FNS], 2017a). This method of helping provide more fruits and vegetables is important for elderly because fruits and vegetables contain many essential nutrients that benefit overall health. Not only is the SFMNP assisting on a national level but also gives grants to many states including Oklahoma and three Indian territories found within Oklahoma (USDA FNS, 2017a). Providing food locally is linked to reducing food insecurity. In one study, increasing availability of locally grown food decreased food insecurity at every income level (Jablonski et al., 2016).

The Oklahoma Senior Farmer's Market Nutrition Program is only available in 12 of the 77 counties in Oklahoma (ODHS, 2017). This indicates many individuals cannot participate because they do not live in one of those counties. This resource may have limited impact because during a limited agriculture growing season individuals receive on average, benefits totaling $25 for the season (Kamp, et al., 2010). In Oklahoma, the season for farmers' markets is the beginning of April-November which only benefits elderly participants for seven months out of the year and provides on average less than $3.60 per month in assistance (ODHS, 2017).

The Commodity Supplemental Food Program (CSFP) is another federal program under the Food and Nutrition Service (FNS). The original recipients were elderly 60 years and above, but now some women, infants, and children can access these resources. Among the various populations low-income is required. The limited variety of foods in CSFP includes nonfat dry milk, oats, rice, pasta, peanut butter, dried beans, and canned meat to list a few (USDA FNS, 2018a). The CFSP helps provide a monthly package to individuals in need. In 2016, over 3,000 seniors were enrolled in commodity supplemental food program in Oklahoma (Craven, 2017).

SNAP is the largest federal food assistance program (Kamp, et al., 2010). SNAP assists low-income individuals in purchasing food items or edible plants and seeds from stores. SNAP does not allow participants from purchasing items such as nonfood products, alcohol, and tobacco. The benefits one receives from SNAP can only be used at certain food stores and farmers' markets. Though SNAP is a federally funded program, each state is in charge of administering the program (USDA FNS, 2017b).

In the 2016 Fiscal Year, 612,869 people on average were served monthly in Oklahoma by the SNAP program. This amounted to $89 million invested in this program for food benefits in the state of Oklahoma (USDA FNS, 2018c). Though this program is impacting many individuals lives, only 77.6% of those who were eligible received this benefit in 2015 (USDA FNS, 2018c). Among the elderly, research indicates 60% of those who are eligible may not be receiving any benefits (Gundersen & Ziliak, 2015). Studies looking at barriers for elderly individuals to use SNAP benefits include stigma and the effort to enroll in the program not being viewed as substantially beneficial in comparison to the incentives of the program (Gundersen & Ziliak, 2015). One study found that if the eligibility rules were simplified or one-on-one assistance was given in filling out the application, this could greatly increase participation (Kamp, et al., 2010).

Another program that can be substituted for SNAP is the Food Distribution Program on Indian Reservation (FDPIR). This program helps distribute food to those who are income eligible and live on or near an American Indian reservation or in Oklahoma for households that are part of a federally-recognized tribe. Oklahoma has 38 federally recognized tribes in the state (National Conference of State Legislatures, 2018).

National Conference of State Legislatures. (2018). Federal and state recognized tribes. Retrieved from http://www.ncsl.org/research/state-tribal-institute/list-of-federal-and-state-recognized-tribes.aspx

The program assists individuals or households with providing food products and nutrition and health information from USDA resources (USDA FNS, 2018b). Not only does Oklahoma have a high American Indian population, but also various studies show that generally speaking, American Indians have a higher level of food insecurity than non-American Indians (Gunderson, 2008).

As households can only participate in SNAP or FDPIR, one study found a small number of households (less than 5%) switched between the two in a 12-month period (USDA FNS, 2016). Some preferred SNAP because of the higher variety of foods received. Others preferred FDPIR for the more culturally sensitive foods and customer service received. Though SNAP and FDPIR are designed to be supplemental food source, over one-third (38%) of FDPIR households reported the FDPIR was the primary household food source.

Food banks in Oklahoma are assisting numerous individuals in obtaining food. The Community Food Bank of Eastern Oklahoma helps distribute food to 450 community partners in 24 different counties (Community Food Bank of Eastern Oklahoma, n.d.a). In the 2017 fiscal year, this food bank contributed 24.7 million pounds of food to Oklahomans, with 32% of this being fresh produce. Each week this food bank provides 396,000 meals to those in eastern Oklahoma. This

food bank has a program called Senior Servings, which brings food to those 60 years and above who are identified as being at high risk for hunger (Community Food Bank of Eastern Oklahoma, n.d.b).

The Regional Food Bank of Oklahoma is the largest hunger-relief charity in the state of Oklahoma (RFBO, n.d.a). This program provides food to feed over 136,000 hungry Oklahomans each week. This bank works alongside more than 1,300 charitable feeding programs that include many other community-based agencies, schools, and organizations. The Regional Food Bank assists those in 18 Oklahoma Housing Authority sites in Oklahoma, Pottawatomie, Seminole, and Comanche counties with a program called Senior Mobile Markets. This program provides a variety of food items to seniors and serves approximately 994 seniors each month (RFBO, n.d.b).

Though there are numerous programs assisting food insecure individuals, there may continue to be poor diet quality in the foods available through these programs. Despite the fact that there are numerous resources, one systematic review looking at the dietary intake of those visiting food pantries and food banks showed inadequate resources to meet the recommended intake of some macronutrients and micronutrients. The studies indicated congruency in that all participants had low mean intakes of fruits and vegetables (Simmet, Depa, Tinnemann, & Stroebele-Benschop, 2017).

Health Education Programs

As the average age of the overall population increases, some individuals are supportive and others opposed to older adult health promotion programs (Heidrich, 1998). Some individuals claim elderly individuals are already past the age that the information will have a positive effect on their lives. Other individuals have commented that the elderly population is unwilling to make lifestyle changes. On the other hand, some conclude health promotion could increase quality of life and extend healthy years of living (Heidrich, 1998). Health promotion, in the elderly, looks different

partly due to the fact that their health is typically less than perfect (Golinowska, Groot, Baji & Pavlova, 2016).

There are numerous benefits to formative evaluation in creating health education programs. Formative evaluation assists not only in the development but also in continued curriculum improvement (Fraser, Chao, Amella, & Mueller, 2016). Formative research assists in a base knowledge of one's audience that is used when articulating and creating educational materials (Evers, Jones, Caputi, & Iverson, 2013). Formative research is crucial in meeting the needs of the population for whom the intervention is taking place (Sahyoun et al., 2004).

Several models and theories promote health behavior changes and impact how to implement nutrition education programs well. The most widely used theory for health promotion and nutrition education is the Social Cognitive Theory (SCT) (Golinowska, Groot, Baji & Pavlova, 2016). SCT describes three main determinants: personal, behavioral, and environmental, that work together to influence health behaviors. The theory states individuals behave in various manners in respect to the perceived risks and/or benefits based on actions. Self-efficacy is an important component of this model. Self-efficacy is not only defined by the confidence to complete a task but also includes the skills needed for the task. Overall, this theory helps look at motivation to assist in behavior changes (Contento, 2016).

One study found self-efficacy and self-regulatory beliefs (empowering individuals to make his/her own choices) are instrumental in promoting lifestyle changes (Anderson, Winett, & Wojcik, 2007). This study looked at healthy behaviors in relationship to whether participants were influenced by positive or negative outcomes, self-regulation, and self-efficacy. While self-efficacy was related to higher fiber, fruits, and vegetables intake, self-regulation was seen to have a higher correlation with one's overall nutritional health. Competence in ability positively or negatively affects how much one self-regulates. Notably, these characteristics are important in

considering an individual's perceived ability to make alterations in regards to lifestyle (Anderson et al., 2007). Nutritional education needs to not only target the life stage of the audience but also include what is motivating and discouraging them to act.

An important aspect to consider is not only the perceived needs of those being educated but also meeting others where they are at through engaging the audience through the education process. One study conducted qualitative focus groups to examine nutrition education interventions for food pantry staff and guests (Dave, Thompson, Jibaja-Weiss, Svendsen-Sanchez, & McNeill, 2017). One of the key items discussed in regards to nutrition education with food pantry guests was how to make healthy meals on a budget (Dave et al., 2017). Another study looking at food pantry guests investigated what educational materials guests desired when given a list of choices (Wood, Shultz, Edlefsen, & Butkus, 2007). The top four topics appreciated by those who attended the class in order are: 1) making fast and easy recipes, 2) helping money for food go further, 3) using and liking leftovers, and 4) having proper food safety measures in the house. Practical skills of helping budget and making food quickly, safely, and enjoyable were important topics for those in this survey (Wood et al., 2007). A study looking at guests from two different food pantries showed that out of over 280 clients, less than half reported they knew how to prepare all the foods that they received from the pantry (Greger, Maly, & Jensen, 2002).

A survey of food pantry staff showed these individuals were more concerned about the disease state of the food pantry guests than clients' food preparation and financial resource skills (Dave et al., 2017). Some food pantry guests were potentially more interested in life skills such as cooking but this study did not necessarily represent all food pantry guest preferences. An additional study showed a positive correlation between client's age and increased desire to hear information about specific diets for diabetes, cancer, and coronary heart disease (Wood et al., 2007). This information is consistent with older individuals' high rates of various disease states.

One survey in food pantries indicated that among food insecure people there was a greater desire for educational materials on “understanding food labels” than other educational options (Wood et al., 2007). The desire to understand food labels may be linked to lower education status seen among food insecure individuals. The food pantry guest might be aware of a deficit of knowledge and believe that this knowledge would be beneficial in making improvements in their lifestyle. Information regarding the low-income elderly population and desires about nutrition educational materials is limited.

Nutritional education through various programs impacts lifestyle. When evaluating the impact of a FDPIR education material around one half reported that the material changed their cooking and eating habits (USDA FNS, 2016). A study looking at the association of health-related food choices to interest in nutritional information showed that those who had higher levels of nutrition information were more likely to pick healthy foods (Zeballos, & Anekwe, 2018). Overall, giving individuals knowledge empowers them to make wiser choices.

Clearly there is a growing need to assist the elderly population age in a healthy manner. Before educational materials and other programs are implemented, the desire and needs of the population must be assessed. This study will fill in the gaps between the current literature about food insecure individuals and what this population in Stillwater, Oklahoma, actually desires. These results will specifically help educators with more pertinent information from the population being assisted in Oklahoma.

CHAPTER III

METHODOLOGY

Survey Development

A survey was developed by the research team to include main sections on food pantry use, food and nutrition education interest, dietary intake, health status, food security, and demographics. The survey was a modification of survey developed by Hannah Robinson (Robinson, 2017).

The food pantry section included questions on whether the food received from the food pantry helped individuals to live at home and how many people ate the food received from the food pantry. The food and nutrition education section focused on logistical information on the design of educational classes and topics of interest. The food and nutrition educational section also examined individuals' self-efficacy in food preparation and interest in food preparation topics. Additionally, the food and nutrition education section also explored individuals' perceptions of the importance of educational topics, desired educational methods, and topics of interest. The dietary intake section included questions on fluid, fruit and vegetable intake, special dietary needs, and food intake. The dietary intake section also included questions on individual's ability to grocery shop, prepare food, eat, and food preparation equipment. The health status section included questions on self-reported height and weight, recent changes in food intake and weight, medication use, physical activity, and disease conditions. The food security section included the USDA six item food security questions along with other questions pertinent to older adults (USDA Economic Research Service, 2017: Wolfe, Frongillo, & Valois, 2003). The demographics

section included questions on age, gender, ethnicity/race, education, employment, living situation, number of adults and children living in the household, social support, food assistance program use, and socioeconomic status.

Due to the fact that the intended audience was low-income older adults, the survey used a larger font and was written at a fourth-grade reading level. These assisted participants in their ability to effectively complete the survey.

Expert Face Validity and Indigenous Face Validity

Three faculty members from the Nutrition Department at Oklahoma State University reviewed and provided input on the survey instrument. Once revisions were made from the experts in the field, the survey was given to eight individuals who obtain food from a food pantry and who were within the age range of the intended survey population. The input gathered from these individuals provided expert and indigenous validity to the survey.

Oklahoma State University Institutional Review Board Approval

Prior to distribution of the survey (Appendix C), the Oklahoma State University Institution Review Board for human subjects reviewed and approved the survey, introductory script (Appendix A), participant informed consent (Appendix B), and study procedure (Appendix D).

Participants

Participants in this study were a convenience sample of adults aged 50-64 and 65 years and above whom obtained food from Our Daily Bread food pantry in Stillwater, Oklahoma. Our Daily Bread food pantry was contacted to see whether they were willing to have this study conducted at their facilities. After contacting the food pantry director and permission was granted to conduct the survey, data collection began. Funding was available to administer the survey to at least 100

individuals in the age range. The goal was to have approximately 50% of the participants from the two different age groups. The objective was to survey individuals until sample size was met. The aim of conducting the survey with an adequate number of the population was to obtain a more accurate representation of Oklahomans 50 years of age and above.

Study Procedure

The solicitation script (Appendix A) was summarized and individuals who verbally voluntarily agreed to participate were provided with a participant information form (Appendix B) along with the survey (Appendix C). If individuals requested assistance with reading the participant consent form or the survey, assistance was provided. Participants were given compensation for their time by receiving twenty dollars in cash.

Data Analysis

Participants self-reported fluid intake was compared to the Food and Nutrition Board Institute of Medicine Adequate Intake (AI) values (Food and Nutrition Board, 2011). For males over the age of 50, the recommendation is 3.7 liters which equates to 15.6 cups. Females over the age of 50 are recommended to have 2.7 liters which is equal to 11.4 cups: The Food and Nutrition Board indicates 20% of fluid intake is provided through food sources leaving 13 cups of fluid for men and 9 cups of fluid for women to be provided through beverages (Food and Nutrition Board, 2011).

Participants self-reported vegetable and fruit intake was compared by gender using lowest level of the range for the Healthy U.S. Style Eating Pattern. Men 50+ years of age are recommended to consume between 2.5 and 3.5 cups daily of vegetables depending on physical activity level and used 2.5 cups as the reference. Women 50+ years of age or above are recommended to consume 2.0 to 3.0 cups daily of vegetables depending on physical activity level and used 2.0 cups as the

reference (Estimated Calorie Needs per… n.d.; USDA Food Patterns…n.d.). In the fruit group, the recommendation is 2 to 2.5 cups for men 50+ year of age and 1.5 to 2.0 cups for females 50+ years of age depending on physical activity level and used 2 cups as reference for males, and 1.5 cups as reference for females (Estimated Calorie Needs per… n.d.; USDA Food Patterns…n.d.).

Body Mass Index (BMI) values were calculated using self-reported weight and height values. BMI is calculated by dividing weight in kilograms by height in meters squared (Center for Control and Disease Prevention [CDC], 2017b). BMI is interpreted for adults as below 18.5 as underweight, 18.5-24.9 as normal or healthy weight, 25.0-29.9 as overweight and 30.0 and above as obese (CDC, 2017b).

Food security status was determined using the cut off levels designed from USDA six item form (USDA Economic Research Service, 2017). A raw score between 0-1 means high or marginal food security while 2-4 means low food security and 5-6 means very low food security (USDA Economic Research Service, 2017).

Data were analyzed using the frequency procedure with PC SAS for Windows Version 9.3 (SAS institute, Cary, NC). Variable data was compared between age groups using Chi-square procedure with PC SAS for Windows Version 9.3 (SAS institute, Cary, NC).

CHAPTER IV

RESULTS

Demographics

Table 1 presents the percentage of participants in the pre-senior (50 to 64 years of age) and senior (65 years of age and above) age groups. There was approximately the same number of participants in each age group.

Table 1 - Participants by age group.

Age categories n=119	**N**	**(%)**
Pre-senior (50-64 years old)	59	49.6%
Senior (65+ years of age)	60	50.4%

Gender for all participants and by age group is presented in Table 2. Overall, a larger percentage was female (70.3%) than male (29.7%). A significant difference was observed in gender distribution between age groups, with the pre-senior group having a larger percentage of males (41.1%) and a smaller percentage of females (58.9%) compared to the senior group (18.2% and 81.8%, respectively).

Table 2 - Gender for all participants and by age group.

	All participants		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
	n	**(%)**	**N**	**(%)**	**n**	**(%)**	
What is your gender?							(6.9589) 0.0083
Male	33	29.7%	23	41.1%	10	18.2%	
Female	78	70.3%	33	58.9%	45	81.8%	

Table 3 shows ethnicity and race for all participants and by age group. Overall, in regards to ethnicity, 4.5% were Hispanic. There was no significant difference in the ethnicity distribution by age group. In regards to race, 76.6% were Caucasian, 13.5% were African American, 8.1% were Native American, 0.9% were Asian, and 3.6% reported their race as other. Although 4 pre-seniors reported their race as other (7.1%) compared to no seniors, the Chi-square test may not be valid due to an expected cell count warning. There was no significant difference in other racial or ethnic groups between age groups.

Table 3 - Ethnicity and race for all participants and by age group.

	All participants		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
Ethnicity	**n**	**%**	**n**	**(%)**	**n**	**(%)**	
Hispanic							(1.8857) 0.1697*
Yes	5	4.5%	4	7.3%	1	1.8%	
No	105	95.5%	51	92.7%	54	98.2%	
Race (check all that apply)	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
African American							(1.8245) 0.1768
Yes	15	13.5%	10	17.9%	5	9.1%	
No	96	86.5%	46	82.1%	50	90.9%	
Asian							(1.0274) 0.3108*
Yes	1	0.9%	0	0.0%	1	1.8%	
No	110	99.1%	56	100.0%	54	98.2%	
Caucasian							(0.7123) 0.3987
Yes	85	76.6%	41	73.2%	44	80.0%	
No	26	23.4%	15	26.8%	11	20.0%	
Native American							(0.1021) 0.7493
Yes	9	8.1%	5	8.9%	4	7.3%	
No	102	91.9%	51	91.1%	51	92.7%	
Other							(4.0754) 0.0435*
Yes	4	3.6%	4	7.1%	0	0.0%	
No	107	96.4%	52	92.9%	55	100.0%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 4 presents marital status for all participants and by age group. Overall, the majority of participants were divorced, separated, or widowed (65.8%), followed by married (21.6%), and never married (12.6%). There was no significant difference in marital status by age group. Although not significant, (p=0.0792), there was a tendency of pre-seniors to be never married

(19.6%) and a smaller percentage were divorced, separated or widowed (60.7%) compared to seniors (5.5% and 70.9%, respectively),

Table 4 - Marital status for all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
What is your marital status?							(5.0720) 0.0792
Never married	14	12.6%	11	19.6%	3	5.5%	
Married	24	21.6%	11	19.6%	13	23.6%	
Divorced, Separated, or Widowed	73	65.8%	34	60.7%	39	70.9%	

Education status for all participants and by age group is presented in Table 5. Overall, the participants had a high school degree or higher with only 21.8% only attending some high school. Overall, the participants were high school graduates (33.6%), followed by some college/associates degree (30.9%), and a Bachelor's degree or higher (13.6%). There was no significant difference between age groups in and food pantry guests' education status.

Table 5 - Education status for all participants and by age group.

	All participants		Pre-Seniors		Seniors		**(Chi-square) p value**
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
Education status?							(2.2953) 0.5134
Some high school	24	21.8%	13	23.2%	11	20.4%	
High school graduate	37	33.6%	19	33.9%	18	33.3%	
Some college/ associates degree	34	30.9%	19	33.9%	15	27.8%	
Bachelor's degree or higher	15	13.6%	5	8.9%	10	18.6%	

Table 6 represents employment status for all participants and by age group. Overall, the majority of participants reported they were not employed (90.1%). There was no significant difference in the employment status between age groups.

Table 6 - Current employment status for all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Job status	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Employed?							(2.6179) 0.2701
No	100	90.1%	48	85.7%	52	94.6%	
Yes	11	9.9%	8	14.2%	3	5.4%	

Table 7 represents different income brackets for all food pantry guests and by age group. Overall the majority of participants reported an annual income of less than $12,000 (62.7%), followed by an annual income of $12,000 to $16,000 (24.6%), and an annual income greater than $16,000 (12.7%). There is no significant difference in income brackets by age groups.

Table 7 - Annual income for all participants and by age group.

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
What range is your annual household income?							(2.1863) 0.3352
Less than $12,000	69	62.7%	38	69.1%	31	56.4%	
$12,000 to $16,000	27	24.6%	12	21.8%	15	27.3%	
Over $16,001	14	12.7%	5	9.1%	9	16.4%	

Food Security

Table 8 shows food security status for all food pantry guests and by age group. Overall, the majority of participants were classified as food insecure (62.8), of which 28.1% had low food security and 34.7% had very low food security. There was no significant difference in food security status by age group. Although not significant (p=0.0779) a larger percentage of pre-seniors tended to be food insecure (70.5%) than seniors (55.0%).

Table 8 - Food security status for all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Food Security Status	**n**	**(%)**	**N**	**(%)**	**n**	**(%)**	**(3.1077) 0.0779**
Food secure	45	37.2%	18	29.5%	27	45.0%	
Food insecure	76	62.8%	43	70.5%	33	55.0%	
Low food secure	34	28.1%	19	31.2%	15	25.0%	
Very low food secure	42	34.7%	24	39.3%	18	30.0%	

Table 9 presents food security status by gender for all participants and by age group. Overall, 69.7% of males were food insecure and 64.1% of females were food insecure. There was no significant difference in food security status among males between age groups. Although not significant (p=0.0661), a higher percentage of pre-senior females tended to be more food insecure (75.8%) than senior females (55.6%).

Table 9 – Participants food security status by gender and by age groups

Gender	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
Males?							(0.0006) 0.9801*
Food secure	10	30.3%	7	30.4%	3	30.0%	
Food insecure	23	69.7%	16	69.6%	7	70.0%	
Females?							(3.3766) 0.0661
Food secure	28	35.9%	8	24.2%	20	44.4%	
Food insecure	50	64.1%	25	75.8%	25	55.6%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 10 presents responses to older adult food security questions for all participants and by age group. Overall, when asked if they ever ate less than they felt they should, 34.6% reported “yes” because they could not get the food they needed even though they had money for food; 28.8% reported “yes” because they were unable to prepare a meal even though they had food in the home; however, 58.9% reported “yes” because they didn’t feel up to cooking. There was no significant difference in participants’ responses to these three questions by age group. When asked if they, “Were you ever hungry but didn’t eat because there wasn’t enough money for food” there was a higher percentage of pre-seniors said “yes” than seniors (43.9% to 30.8%,

respectively) although the p=0.0092 the Chi-square test may not be valid due to an expected cell count warning. When asked if they were ever hungry but did not eat, 24.4% reported "yes" because they could not get the food they needed even though they had the money for food. Although a smaller percentage of pre-seniors responded "no" to this question (62.5%) than seniors (79.6%), the Chi-square test may not be valid due to an expected cell count warning. In addition, 31.5% reported "yes" to this question because they were unable to prepare a meal even though they had food in the house; however, 57.0% reported "yes" because they did not feel up to cooking. There was no significant difference in participants' responses to these two questions by age group. When asked if they were unable to eat the right food for their health, 63.1% reported "yes" because they could not afford the right food for their health. Although a smaller percentage of pre-seniors reported "no" to this question (24.6%) than seniors (40.7%), the Chi-square test may not be valid due to an expected cell count warning. In addition, 31.8% reported "yes" to this question because they could not get the food they needed even though they had money for food, 37.6% reported "yes" to this question because they were unable to prepare meals even though they had food in the house; however, 54.1% reported "yes" because they did not feel up to cooking. There was no significant difference in participants' responses to these two questions by age group.

Table 10 - Participants' responses to older adult food security questions and by age group.

In the last 12 months…	**All participants**		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
Did you ever eat less than you felt you should because	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
There wasn't enough money for food??							(1.3590) 0.2437
Yes	52	49.1%	29	54.7%	23	43.4%	
No	54	50.9%	24	45.3%	30	56.6%	
You couldn't get the food you needed even though you had money for food?							(2.6539) 0.1033
Yes	38	36.5%	23	44.2%	15	28.9%	
No	66	63.5%	29	55.8%	37	71.2.%	
You were unable to prepare a meal even though you had food in the house?							(0.6107) 0.4345

In the last 12 months…	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Did you ever eat less than you felt you should because	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Yes	32	29.9%	18	33.3%	14	26.4%	
No	75	70.1%	36	66.7%	39	73.6%	
You didn't feel up to cooking?							(0.7872) 0.3750
Yes	63	61.2%	34	65.4%	29	56.9%	
No	40	38.8%	18	34.6%	22	43.1%	
Were you ever hungry but didn't eat because?							
There wasn't enough money for food?							(3.5791) 0.0585
Yes	41	39.8%	25	49.0%	16	30.8%	
No	62	60.2%	26	51.0%	36	69.2%	
You couldn't get the food you needed even though you had the money for food?							(1.6621) 0.1973
Yes	27	25.7%	16	31.4%	11	20.4%	
No	78	74.3%	35	68.6%	43	79.6%	
You were unable to prepare a meal even though you had food in the house?							(0.8233) 0.3642
Yes	34	33.0%	15	28.9%	19	37.3%	
No	69	67.0%	37	71.1%	32	62.7%	
You didn't feel up to cooking?							(0.0170 0.8963
Yes	61	58.6%	32	59.3%	29	58.0%	
No	43	41.4%	22	40.7%	21	42.0%	
Were you ever unable to eat the right food for your health because…							
You couldn't afford them?							(2.2551) 0.1332
Yes	70	66.0%	38	73.1%	32	59.3%	
No	36	34.0%	14	26.9%	22	40.7%	
You couldn't get the food you needed even though you had money for food?							(1.4222) 0.2330
Yes	34	33.7%	20	39.2%	14	28.0%	
No	67	66.3%	31	60.8%	36	72.0%	
You were unable to prepare a meal even though you had food in the house?							(0.1972) 0.6570
Yes	41	38.7%	22	40.7%	19	36.5%	
No	65	61.3%	32	59.3%	33	63.5%	
You didn't feel up to cooking?							(0.0229) 0.8797
Yes	59	55.7%	31	56.4%	28	54.9%	
No	47	44.3%	24	43.6%	23	45.1%	

Living Arrangement and Assistance

Table 11 presents living situations for all participants and by age group. Overall, the majority of participants (92.8%) reported living in an apartment, house, or mobile home. There was no significant difference in living situations by age group.

Table 11 - Living situation for all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
	n	(%)	n	(%)	n	(%)	p value
Living situation?							(5.8005) 0.1217*
Apartment/House/ Mobile home	103	92.8%	55	98.2%	48	87.3%	
Homeless	2	1.8%	0	0.0%	2	3.6%	
Local shelter	0	0.0%	0	0.0%	0	0.0%	
Retirement center	3	2.7%	0	0.0%	3	5.5%	
Other	3	2.7%	1	1.8%	2	3.6%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 12 presents the city in which the participants resided. The majority of participants (72.3%) resided in Stillwater, followed by Cushing (5.9%), Perkins (5.9%), and Yale (5.9%). There was a difference (p=0.0266) between in city of residence by age groups with a larger percentage of pre-seniors (78.4% residing in Stillwater than seniors (66.0%) and a smaller percentage of pre-seniors (0.0%) living in Yale than seniors (12.0%). The Chi-square test may not be valid due to an expected cell count warning.

Table 12 - City considered home for all food pantry guests by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
	n	(%)	n	(%)	n	(%)	p value
City?							(14.2818) 0.0266*
Stillwater	73	72.3%	40	78.4%	33	66.0%	
Others	28	27.7%	11	24.6%	17	34.0%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 13 presents the number of other adults or children who lived with participants by age group. Approximately half of participants did not live with any other adults (48.8%); however, about a fourth of participants lived with one or two other adults (26.5% and 24.8%, respectively). There was no significant difference in the number of other adults who lived with between age

groups. The majority of participants reported not living with children under 18 years of age (77.1%); however, 19.8% did report living with children under 18 years of age. Although not significant (p=0.0709), a larger percentage of seniors (84.6%), tended to be more likely to living with children under 18 years of age than pre-seniors (69.8%).

Table 13 - Number of adults and children living with participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
	n	(%)	n	(%)	n	(%)	p value
Not including yourself, how many adults (18 years or older) live with you?							(0.2670) 0.8750
Zero	59	48.8%	30	49.2%	29	48.3%	
One	32	26.5%	15	24.6%	17	28.3%	
Two	30	24.8%	16	26.2%	14	23.3%	
Do any children (younger than 18 years) live with you?							(3.2624) 0.0709
No	81	77.1%	37	69.8%	44	84.6%	
Yes	24	22.9%	16	30.2%	8	15.4%	

Table 14 presents the number of family or friends participants had and by nearby that could assist them age group. The majority of participants (56.76%) reported they had very few family and friends nearby who could assist them. There was no significant difference by age groups with the amount of family or friends nearby who can assist the participants.

Table 14 - Family members or friends nearby to assist all food pantry guests by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
	n	(%)	n	(%)	n	(%)	p value
Nearby individuals for help?							(3.6549) 0.1608
None	29	26.1%	19	33.9%	10	18.2%	
Very few	63	56.8%	29	51.8%	34	61.8%	
Many	19	17.1%	8	14.3%	11	20.0%	

Table 15 presents food assistance programs used by participants and by age group. The majority of participants (79.3%) reported using food pantries, followed by SNAP (41.4%), and community/faith-based meals (19.8%). Only a small percentage reported using FDPIR (3.6%), home-delivered meals (4.5%) and Senior Famers Market (0.9%). There was a significant difference in using community/faith-based meals by age groups (p=0.0196). A higher percentage

(28.6%) of pre-seniors reported using community/faith-based meals than seniors (10.9%) Among the other food assistance programs, there was no significant difference in use by age group.

Table 15 - Food assistance programs used by all participants and by age group

	Participants		Pre-Seniors		Seniors		(Chi-square)
	N	(%)	n	(%)	N	(%)	p value
Food assistance?							
Community/Church Meals							(5.4470) 0.0196
Yes	22	19.8%	16	28.6%	6	10.9%	
No	89	80.2%	40	71.4%	49	89.1%	
Food Distribution Program on Indian Reservations							(1.0004) 0.3172*
Yes	4	3.6%	3	5.4%	1	1.8%	
No	107	96.4%	53	94.6%	54	98.2%	
Food Pantries							(0.0799) 0.7774
Yes	88	79.3%	45	80.4%	43	78.2%	
No	23	20.7%	11	19.6%	12	21.8%	
Food Stamps/SNAP							(2.1363) 0.1438
Yes	46	41.4%	27	48.2%	19	34.6%	
No	65	58.6%	29	51.8%	36	65.5%	
Home Delivered Meals							(1.8289) 0.1763*
Yes	5	4.5%	4	7.1%	1	1.8%	
No	106	95.5%	52	92.9%	54	98.2%	
Senior Farmers Market							(1.0274) 0.3108*
Yes	1	0.9%	0	0.0%	1	1.8%	
No	110	99.1%	56	100.0%	54	98.2%	
Senior Meals							(1.0752) 0.2998*
Yes	4	3.6%	1	1.8%	3	5.5%	
No	107	96.4%	55	98.2%	52	94.6%	
Other							(0.0005) 0.9819*
Yes	6	5.4%	3	5.4%	3	5.5%	
No	105	94.6%	53	94.6%	52	94.6%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 16 presents whether the food pantry helped participants to stay at home by age group. The majority of participants (94.8%) reported the food they received did help them to remain at home. There was no significant difference in whether the food they received helped participants to stay at home between the age groups.

Table 16 - Food pantry food helps to continue to live at home all food pantry guests by age group

	Participants		Pre-Seniors		Seniors		(Chi-square)
	n	(%)	n	(%)	n	(%)	p value
Food pantry help stay at home?							(1.2000) 0.5488*
Yes	110	94.8%	55	94.8%	55	94.8%	
No	5	4.3%	2	3.5%	3	5.2%	
Do not know	1	0.9%	1	1.7%	0	0.0%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 17 presents the number of people who ate the food received from the food pantry for all participants and by age group. The majority of participants indicated only one person ate the food received (82.9%), followed by two people (29.8%), and three people (17.4%). No significant difference between age groups in the number of people who ate the food received from the food pantry.

Table 17 - Food received from food pantry and number of people it helps with all food pantry guests by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
	N	(%)	n	(%)	N	(%)	p value
Number of people the food pantry feeds?							(1.4273) 0.4898
One	64	52.9%	29	47.5%	35	58.3%	
Two to Three	36	29.8%	20	32.8%	16	26.7%	
Four plus	21	17.4%	12	19.7%	9	15.0%	

Dietary Patterns and Resources

Table 18 presents factors that influenced dietary intake of by age groups. The majority of participants reported they “often” felt comfortable reading and understanding food labels (55.4%), planning menus (51.8%), writing a shopping list (62.3%), and selecting healthy foods at the grocery store (56.5%). There was a significant difference by age group in participants reporting they felt comfortable planning menus, with a larger percentage of pre-seniors (62.5%) reporting they were often comfortable compared to seniors (41.1%). In addition, the participants reported they “sometimes” received food from the food pantry that they did not know how to prepare (43.1%).

Although the participants reported they "sometimes" had problems grocery shopping; a good portion also reported they did not have problems preparing meals (44.8%), eating (67.3%), or with taste or smell (70.8%). There was a significant difference in participants reporting they had problems with taste or smell by age group, with a larger percentage of pre-seniors (17.0%) reported they had problems than seniors (1.9%) and a smaller percentage of pre-seniors reporting they sometimes had problems (15.1%) compared to seniors (24.5%).

Table 18 - Factors influencing dietary intake for all food pantry guests and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square)
Do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**p value**
Feel comfortable reading and understanding food labels?							(4.1375) 0.1263
Yes, often	62	55.4%	35	62.5%	27	48.2%	
Yes, sometimes	38	33.9%	18	32.1%	20	35.7%	
No	12	10.7%	3	5.4%	9	16.1%	
Get foods from the pantry that you do not know how to prepare?							(1.5555) 0.4594
Yes, often	16	14.7%	9	16.4%	7	13.0%	
Yes, sometimes	47	43.1%	26	47.3%	21	38.9%	
No	46	42.2%	20	36.4%	26	48.2%	
Feel comfortable planning menus?							(6.4828) 0.0391
Yes, often	58	51.8%	35	62.5%	23	41.1%	
Yes, sometimes	36	32.1%	12	21.4%	24	42.9%	
No	18	16.1%	9	16.1%	9	16.1%	
Feel comfortable writing a shopping list?							(0.3257) 0.8497
Yes, often	66	62.3%	33	60.0%	33	64.7%	
Yes, sometimes	28	26.4%	15	27.3%	13	25.5%	
No	12	11.3%	7	12.7%	5	9.8%	
Feel comfortable selecting healthy foods at the grocery store?							(0.9090) 0.6348
Yes, often	61	56.5%	31	56.4%	30	56.6%	
Yes, sometimes	36	33.3%	17	30.9%	19	35.9%	
No	11	10.2%	7	12.7%	4	7.6%	
Have problems grocery shopping (energy, driving, walking, etc.)?							(0.0177) 0.9912
Yes, often	22	20.6%	11	20.4%	11	20.8%	
Yes, sometimes	48	44.9%	24	44.4%	24	45.3%	
No	37	34.6%	19	35.2%	18	34.0%	
Have problems preparing meals (energy, seeing, standing, walking, strength, and using your hands)?							(2.2587) 0.3232
Yes, often	24	22.9%	13	24.5%	11	21.2%	
Yes, sometimes	34	32.4%	20	37.7%	14	26.9%	
No	47	44.8%	20	37.7%	27	51.9%	
Have problems eating (chewing, swallowing, using your hands)?							(1.3429) 0.5110*
Yes, often	8	7.5%	5	9.6%	3	5.5%	
Yes, sometimes	27	25.2%	11	21.2%	16	29.1%	
No	72	67.3%	36	69.2%	36	65.5%	

	All participants		Pre-Seniors		Seniors		(Chi-square)
Do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**p value**
Have problems with taste or smell?							(7.7105) 0.0212
Yes, often	10	9.4%	9	17.0%	1	1.9%	
Yes, sometimes	21	19.8%	8	15.1%	13	24.5%	
No	75	70.8%	36	67.9%	39	73.6%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 19 presents coping mechanisms utilized by all participants and by age group. When participants did not have enough food, the participants reported they "sometimes" ate smaller meals (46.7%), "sometimes" skipped meals (47.6%), and often stretched meals (47.7%). Although not significant (p=0.0968), seniors (45.1%) reported they "often" ate smaller meals than pre-seniors (37.5%) and a smaller percentage of seniors (37.3%) reported they "sometimes" ate smaller meals than pre-seniors (55.4%). In addition, the participants reported they did not eat expired foods (52.4%), eat foods that had been stored too long (45.4%), at community meals (56.2%) or received help with food from family and friends (46.2%). Although not significant (p=0.0705) a larger percentage of pre-seniors reported they "sometimes" received help with food (44.8%) compared to seniors (31.3%), whereas a larger percentage of seniors reported they did not receive help with food (58.3%) than pre-seniors (36.2%).

Table 19 - Coping mechanisms for all food pantry guests and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square)
How often do you have enough food, do you ever,	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**p value**
Eat smaller meals?							(4.6705) 0.0968
Yes, often	44	41.1%	21	37.5%	23	45.1%	
Yes, sometimes	50	46.7%	31	55.4%	19	37.3%	
No	13	12.2%	4	7.1%	9	17.7%	
Skip meals?							(0.2708) 0.8733
Yes, often	26	24.8%	14	25.5%	12	24.0%	
Yes, sometimes	50	47.6%	27	49.1%	23	46.0%	
No	29	27.6%	14	25.5%	15	30.0%	
Stretch meals? (make soups or casseroles; add rice or noodles)							(3.0005) 0.2231
Yes, often	51	47.7%	26	47.3%	25	48.1%	
Yes, sometimes	43	40.2%	25	45.5%	18	34.6%	
No	13	12.2%	4	7.3%	9	17.3%	

	All participants		Pre-Seniors		Seniors		(Chi-square)
How often do you have enough food, do you ever,	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**p value**
Eat expired foods?							(1.2359) 0.5390
Yes, often	14	13.6%	9	17.3%	5	9.8%	
Yes, sometimes	35	34.0%	17	32.7%	18	35.3%	
No	54	52.4%	26	50.0%	28	54.9%	
Eat foods that may have been stored too long?							(0.7125) 0.7003
Yes, often	16	14.8%	10	17.5%	6	11.8%	
Yes, sometimes	43	39.8%	22	38.6%	21	41.2%	
No	49	45.4%	25	43.9%	24	47.1%	
Eat community meals provided by local churches?							(4.2711) 0.1182
Yes, often	17	16.2%	7	12.5%	10	20.4%	
Yes, sometimes	29	27.6%	20	35.7%	9	18.4%	
No	59	56.2%	29	51.8%	30	61.2%	
Get help with food from family or friends?							(5.3050) 0.0705
Yes, often	16	15.1%	11	19.0%	5	10.4%	
Yes, sometimes	41	38.7%	26	44.8%	15	31.3%	
No	49	46.2%	21	36.2%	28	58.3%	

Table 20 presents food preparation equipment and resources among all participants and food by age groups. The majority of participants had to electricity (98.2%), running water (96.5%), a refrigerator (96.4%), a freezer (83.0%), an oven (91.2%), a microwave (92.8%), a crock pot (82.9%), a stove top (94.6%), space to store frozen food (83.8%), space to store refrigerated food (92.0%), space to store dry food (93.8%), tools to prepare meals at home (92.9%), and the skills to prepare meals at home (95.5%). Although a majority, a smaller percentage had access to a smart phone (55.1%). Although a smaller percentage of pre-seniors had a microwave (87.3%) than seniors (98.2%), the Chi-square test may not be valid due to an expected cell count warning.

Table 20 - Access to food preparation equipment and resources among all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Do you have access to…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Running water?							(1.0364) 0.3087*
Yes	110	96.5%	54	94.7%	56	98.3%	
No	4	3.5%	3	5.3%	1	1.8%	

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Do you have access to…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
A refrigerator?							(1.0370) 0.3085*
Yes	108	96.4%	53	94.6%	55	98.2%	
No	4	3.6%	3	5.4%	1	1.8%	
A freezer?							(0.5705) 0.4501
Yes	93	83.0%	45	80.4%	48	85.7%	
No	19	17.0%	11	19.6%	8	14.3%	
An oven?							(0.4385) 0.5079
Yes	104	91.2%	51	89.5%	53	93.0%	
No	10	8.8%	6	10.5%	4	7.0%	
A microwave?							(4.9671) 0.0258*
Yes	103	92.8%	48	87.3%	55	98.2%	
No	8	7.2%	7	12.7%	1	1.8%	
A crock pot?							(0.5082) 0.4759
Yes	92	82.9%	45	80.4%	47	85.5%	
No	19	17.1%	11	19.6%	8	14.6%	
A stove top?							(0.1524) 0.6963*
Yes	105	93.8%	52	92.9%	53	94.6%	
No	7	6.3%	4	7.1%	3	5.4%	
Enough space to store frozen food?							(0.3100) 0.5777
Yes	93	83.8%	45	81.8%	48	85.7%	
No	18	16.2%	10	18.2%	8	14.3%	
Enough space to store refrigerated food?							(0.1208) 0.7281*
Yes	103	92.0%	52	92.9%	51	91.1%	
No	9	8.0%	4	7.1%	5	8.9%	
Enough space to store dry food?							(1.3714) 0.2416*
Yes	105	93.8%	51	91.1%	54	96.4%	
No	7	6.3%	5	8.9%	2	3.6%	
The right tools to prepare meals at home?							(2.0034) 0.1569*
Yes	104	92.9%	51	89.5%	53	96.4%	
No	8	7.1%	6	10.5%	2	3.6%	
Have the cooking skills to prepare meals at home?							(1.8289) 0.1763*
Yes	106	95.5%	54	98.2%	52	92.9%	
No	5	4.5%	1	1.8%	4	7.1%	
Have a smart phone?							(1.0548) 0.3044
Yes	61	56.0%	34	60.7%	27	50.9%	
No	48	44.0%	22	39.3%	26	49.1%	
Have electricity?							(0.0000) 1.0000*
Yes	110	98.2%	55	98.2%	55	98.2%	
No	2	1.8%	1	1.8%	1	1.8%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 21 presents dietary patterns for all participants and by age group. The participants reported that “on most days” they ate breakfast (42.5%), ate lunch (54.1%), ate dinner (72.7%), ate snacks

(51.4%), prepared meals at home (68.5%) and at meals alone (38.0%). In addition, the participants reported that on "some days" they had the food they needed to make healthy meals (41.5%) and ate meals with others (38.0%). Furthermore, the participants reported the "seldom, if ever," ate fast food (55.1%), felt lonely (44.1%), or received help from family or friends with shopping (62.4%) or preparing meals (59.6%). There was no significant difference in participants' dietary patterns by age group.

Table 21 - Dietary patterns and behaviors for all food pantry guest by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How often do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Eat breakfast?							(3.0635) 0.2162
Seldom, if ever	28	25.0%	10	17.9%	18	32.1%	
Some days	36	32.1%	20	35.7%	16	28.6%	
Most days	48	46.4%	26	46.4%	22	39.3%	
Eat lunch?							(0.6743) 0.7138
Seldom, if ever	11	10.3%	6	10.9%	5	9.6%	
Some days	37	34.6%	17	30.9.%	20	38.5%	
Most days	59	55.1%	32	58.2%	27	51.9%	
Eat dinner?							(1.9446) 0.3782
Seldom, if ever	6	5.5%	4	7.3%	2	3.7%	
Some days	23	21.1%	9	16.4%	14	25.9%	
Most days	80	73.4%	42	76.4%	38	70.4%	
Eat snacks?							(0.7963) 0.6716
Seldom, if ever	18	17.3%	9	17.3%	9	17.3%	
Some days	32	30.8%	14	26.9%	18	34.6%	
Most days	54	51.9%	29	55.8%	25	48.1%	
Prepare meals at home?							(0.1555) 0.9252
Seldom, if ever	9	8.7%	5	9.8%	4	7.7%	
Some days	20	19.4%	10	19.6%	10	19.2%	
Most days	74	71.8%	36	70.6%	38	73.1%	
Have the food you need to make healthy meals?							(1.6195) 0.4450
Seldom, if ever	11	11.2%	7	14.6%	4	8.0%	
Some days	44	44.9%	19	39.6%	25	50.0%	
Most days	43	43.9%	22	45.8%	21	42.0%	
Eat meals alone?							(1.3996) 0.4967
Seldom, if ever	23	22.1%	9	17.3%	14	26.9%	
Some days	28	26.9%	15	28.9%	13	25.0%	
Most days	53	51.0%	28	53.9%	25	48.1%	
Eat meals with others?							(1.3491) 0.5094
Seldom, if ever	29	27.6%	15	28.3%	14	26.9%	
Some days	41	39.1%	18	34.0%	23	44.2%	
Most days	35	33.3%	20	37.7%	15	28.9%	

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How often do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Eat fast food?							(1.7811) 0.4104
Seldom, if ever	59	56.7%	28	53.9%	31	59.6%	
Some days	35	33.7%	17	32.7%	18	34.6%	
Most days	10	9.6%	7	13.5%	3	5.8%	
Feel lonely?							(2.8787) 0.2371
Seldom, if ever	45	47.4%	19	40.4%	26	54.2%	
Some days	30	31.6%	15	31.9%	15	31.3%	
Most days	20	21.1%	13	27.7%	7	14.6%	
Get help shopping for food from family or friends?							(0.4092) 0.8150
Seldom, if ever	63	65.0%	31	62.0%	32	65.0%	
Some days	14	14.4%	8	16.0%	6	14.4%	
Most days	20	20.6%	11	22.0%	9	19.2%	
Get help preparing meals from family or friends?							(1.2263) 0.5416
Seldom, if ever	59	64.1%	29	60.4%	30	68.2%	
Some days	21	22.8%	11	22.9%	10	22.7%	
Most days	12	13.0%	8	16.7%	4	9.1%	

Table 22 presents changes in food intake and weight over the past three months. Although approximately half of participants reported their food intake (49.6%) and weight had not changed over the past three months (50.0%), slightly over one-third reported their food intake and weight decreased over the past three months (35.4% and 36.4%), respectively. There was no significant difference in changes in food intake or weight by age group.

Table 22 - Changes in food intake and weight for all guests and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Without wanting to…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Has your food intake changed over the past 3 months?							(0.6361) 0.8881*
No	55	49.6%	28	48.3%	27	51.0%	
Yes, decreased	39	35.4%	21	36.2%	18	34.0%	
Yes, increased	9	8.1%	4	6.9%	5	9.4%	
Do not know	8	7.2%	5	8.6%	3	5.7%	
Has your weight changed over the past 3 months?							(0.9844) 0.8050*
No	55	50.0%	28	47.5%	27	52.9%	
Yes, decreased	40	36.4%	23	39.0%	17	33.3%	
Yes, increased	8	7.3%	5	8.5%	3	5.9%	
Do not know	7	6.4%	3	5.1%	4	7.8%	

*Chi-square test may not be valid due to an expected cell count warning.

Health Status

Table 23 presents body mass index for all participants and by age group. The participants were obese (38.7%), followed by overweight (30.3%), normal weight (22.3%), and underweight (8.4%). There was no significant difference in body mass index by age group.

Table 23 - Body mass index for food pantry guests and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	(%)	n	(%)	n	(%)	
Body mass index category							(0.8210) 0.8444
Underweight	10	8.4%	5	8.5%	5	8.3%	
Normal weight	27	22.3%	13	22.0%	14	23.3%	
Overweight	36	30.3%	16	27.1%	20	33.3%	
Obese	46	38.7%	25	42.4%	21	35.0%	

Table 24 presents health conditions for all participants and by age group. The two most prevalent conditions reported among participants were high blood pressure (59.5%) and arthritis (56.9%). Although not significant (p=0.0514) pre-seniors tended to report having depression (47.5%) more than seniors (29.8%). Similarly, although not significant, pre-seniors tended to report having high blood pressure (67.8%) than seniors (50.9%). None of the health conditions were significantly different by age group.

Table 24 - Health conditions among all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Conditions[2] (check all that apply)	n	(%)	n	(%)	n	(%)	
Arthritis							(0.8312) 0.3619
Yes	66	56.9%	36	61.07%	30	52.6%	
No	50	43.1%	23	38.98%	27	47.4%	
Cancer							(1.4253) 0.2325*
Yes	7	6.1%	2	3.5%	5	8.8%	
No	108	93.9%	56	96.6%	52	91.2%	
Dental Problem							(0.0261) 0.8716
Yes	50	43.1%	25	42.4%	25	43.9%	
No	66	56.9%	34	57.6%	32	56.1%	

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Conditions[2] (check all that apply)	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Depression							(3.7964) 0.0514
Yes	45	38.8%	28	47.5%	17	29.8%	
No	71	61.2%	31	52.5%	40	70.2%	
Diabetes							(1.0764) 0.2995
Yes	40	34.5%	23	39.0%	17	29.8%	
No	76	65.5%	36	61.0%	40	70.2%	
Fatigue							(0.6102) 0.4347
Yes	49	42.2%	27	45.8%	22	38.6%	
No	67	57.8%	32	54.2%	35	61.4%	
Food Allergies**							(0.0660) 0.7973
Yes	11	9.5%	6	10.2%	5	8.8%	
No	105	90.5%	53	89.8%	52	91.2%	
Heart Disease							(0.0131) 0.9087
Yes	32	27.6%	16	27.1%	16	28.1%	
No	84	72.4%	43	72.9%	41	71.9%	
High Blood Pressure							(3.4436) 0.0635
Yes	69	59.5%	40	67.8%	29	50.9%	
No	47	40.5%	19	32.2%	28	49.1%	
Osteoporosis							(0.6004) 0.4384
Yes	25	21.6%	11	18.6%	14	24.6%	
No	91	78.5%	48	81.4%	43	75.4%	

**Food allergies reported included lactose, strawberry, coconut, soy, tuna, avocados, dairy, mushroom, and tea.

Table 25 presents activity levels for all participants and by age group. The participants (46.0%) reported during a normal week they sometimes were active enough to break a sweat. There was no significant difference in physical activity level by age groups.

Table 25 - Activity level for all participants and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Normal week how often do you do activity that break a sweat?	**N**	**(%)**	**n**	**(%)**	**n**	**(%)**	(2.1251) 0.3456
Often	32	28.3%	20	33.9%	12	22.2%	
Sometimes	52	46.0%	24	40.7%	28	51.9%	
Rarely or Never	29	25.7%	15	25.4%	14	25.9%	

Participants were also asked the number of medications taken on a regular basis. For all participants the average number of medications was 5.7 +/

-. In the pre-senior group, the average was 4.8+/- and the senior group was 6.7+/-.

Table 26 presents dietary need for all participants and by age group. The majority of participants reported they did not have special dietary needs including low fat (78.6%), low sodium (68.4%), or low sugar (64.1%) There is no significant difference in dietary needs by age group.

Table 26 - Dietary needs of food pantry guest by age group

	All participants*		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
Dietary needs (check all that apply)	**n**	**(%)**	**n**	**(%)**	**N**	**(%)**	
Low fat							(2.6473) 0.1037
Yes	25	21.4%	16	27.6%	9	15.3%	
No	92	78.6%	42	72.4%	50	84.8%	
Low sodium							(1.1172) 0.2905
Yes	37	31.6%	21	36.2%	16	27.1%	
No	80	68.4%	37	63.8%	43	72.9%	
Low sugar							(0.0048) 0.9448
Yes	42	35.9%	21	36.2%	21	35.6%	
No	75	64.1%	37	63.8%	38	64.4%	

* Eleven participants did report other types of dietary needs such as high protein, low carb, and heart health.

Table 27 presents fluid, fruits and vegetables intake by gender and within each gender by age group. The majority of males (90.9%) and females (80.8%) did not consume the recommended amount of fluid. In addition, the majority males (72.7%) and of females (66.7%) did not consume the lowest recommended amount of fruits. Furthermore, the majority of males (84.9%) and 50.0% of females did not consume the lowest recommended amount of vegetables. There is no significant difference in fluid, fruits or vegetables intakes within each gender by age group.

Table 27 - Fluid, fruits, and vegetables intake by gender and by age groups within gender

Dietary status…	**All participants***		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
Fluid Status?	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Males?							(1.4348) 0.2310*
< 13 cups/day	30	90.9%	20	87.0%	10	100.0%	
≥ 13 cups/day	3	9.1%	3	13.0%	0	0.0%	
Females?							(0.1446)

Dietary status…	All participants*		Pre-Seniors		Seniors		(Chi-square) p value
Fluid Status?	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
< 9 cups/day	63	80.8%	26	78.8%	37	82.2%	
≥ 9 cups/day	15	19.2%	7	21.2%	8	17.8%	
Fruit Consumption?							
Males?							(0.0538) 0.8166*
< 2 cups/day	24	72.7%	17	73.9%	7	70.0%	
≥ 2 cups/day	9	27.3%	6	26.1%	3	30.0%	
Females?							(0.0000) 1.0000
< 1.5 cups/day	52	66.7%	22	66.7%	30	66.7%	
≥ 1.5 cups/day	26	33.3%	11	33.3%	15	33.3%	
Vegetable Consumption?							
Males?							(0.2962) 0.5863*
< 2.5 cups/day	28	84.9%	19	82.6%	9	90.0%	
≥ 2.5 cups/day	5	15.2%	4	17.4%	1	10.0%	
Females?							(0.0525) 0.8187
< 2.0 cups/day	39	50.0%	17	51.5%	22	48.9%	
≥ 2.0 cups/day	39	50.0%	16	48.5%	23	51.1%	

*Chi-square test may not be valid due to an expected cell count warning.

Nutrition Interest and Educational Format

Table 28 presents interest in food and nutrition education. Only 18.1% of participants indicated they were interested in food and nutrition education, 45.6% indicated they may be interested, and 36.2% reported they were not interested in education. There was no significant difference in participants' interest in food and nutrition education by age groups.

Table 28 - Interest in attending food and nutrition education class for all participants and by age groups.

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Interested in nutrition education?	**n**	**(%)**	**n**	**(%)**	**N**	**(%)**	(1.5903) 0.4515
Yes	21	18.1%	13	22.4%	8	13.8%	
Maybe	53	45.7%	26	44.8%	27	46.6%	
No	42	36.2%	19	32.8%	23	39.7%	

Table 29 presents desired length of classes for all participants and by age group. Almost half of all the participants (48.6%) indicated they would like the classes to last 30 minutes. There is no significant difference in desired class length between age groups.

Table 29 - Time length desired for food and nutrition education class among all participants and by age groups

	All participants**		Pre-Seniors		Seniors		(Chi-square) p value
Time length?	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
30 minutes	51	48.6%	28	53.9%	23	43.4%	(2.4513) 0.4842
45 minutes	15	14.3%	6	11.5%	9	17.0%	
1 hour	27	25.7%	14	26.9%	13	24.5%	
Other**	12	11.4%	4	7.7%	8	15.1%	

** Several individuals who had a range of time that they were okay with including a half an hour to an hour. Some individuals stated they, “didn’t care” or, “NA” and one indicated because of health reasons they would not be able to sit for a class.

Table 30 presents the time of day for food and nutrition education classes to be offered among all participants and by age groups. Morning was reported by 35.0% of participants, early afternoon by 30.8%, late afternoon by 18.8%, and evening by 12.8%. There was no significant difference in the desired time of day for education classes by age groups. Although not significant (p=0.0527%), more pre-seniors tended to prefer late afternoon (25.9%) compared to seniors (11.9%).

Table 30 - Time of day desired for food and nutrition education class among all participants and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Time of day?	**n**	**(%)**	**n**	**(%)**	**N**	**(%)**	
Morning							(0.2636) 0.6076
Yes	41	35.0%	19	32.8%	22	37.3%	
No	76	65.0%	39	67.2%	37	62.7%	
Early afternoon							(1.3002) 0.2542
Yes	36	30.8%	15	25.9%	21	35.6%	
No	81	69.2%	43	74.1%	38	64.4%	
Late afternoon							(3.7534) 0.0527
Yes	22	18.8%	15	25.9%	7	11.9%	
No	95	81.2%	43	74.1%	52	88.1%	
Evening							(2.0112) 0.1561
Yes	15	12.8%	10	17.24%	5	8.5%	
No	102	87.2%	48	82.8%	54	91.5%	

Table 31 presents which day of the week was desired for food and nutrition education classes among all participants and by age group. Wednesday was selected by some of the participants (47.0%), followed by Tuesday (41.9%), Monday (39.3%), Thursday (36.8%), Friday (29.1%), and lastly Saturday (26.5%). There was no significant difference in the desired day of the week for food and nutrition education classes by age group.

Table 31 - Day desired for food and nutrition education classes for all participants and by age group

	All participants		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
Day of the week (check all that apply)	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Monday							(0.0055) 0.9407
Yes	46	39.3%	23	39.7%	23	39.0%	
No	71	60.7%	35	60.3%	36	61.0%	
Tuesday							(1.0311) 0.3099
Yes	49	41.9%	27	46.6%	22	37.3%	
No	68	58.1%	31	53.5%	37	62.7%	
Wednesday							(0.4132) 0.5204
Yes	55	47.0%	29	50.0%	26	44.1%	
No	62	53.0%	29	50.0%	33	55.9%	
Thursday							(1.0594) 0.3033
Yes	43	36.8%	24	41.4%	19	32.2%	
No	74	63.3%	34	58.6%	40	67.8%	
Friday							(0.1212) 0.7278
Yes	34	29.1%	16	27.6%	18	30.5%	
No	83	70.9%	42	72.4%	41	69.5%	
Saturday							(1.9908) 0.1583
Yes	31	26.5%	12	20.7%	19	32.2%	
No	86	73.5%	46	79.3%	40	67.8%	

Table 32 presents desires regarding a series of food and nutrition education classes among all participants and by age groups. The 43.1%of participants were not interested in attending an educational series. In addition, 31.4% wanted two classes if there was a series. There was no significant difference in interest in an educational series or the number of classes in a series by age groups.

Table 32 - Preference for series of food and nutrition education classes among all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Series of classes (check all that apply)	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Would you attend?							(3.0385) 0.2189
Yes	27	24.8%	16	30.8%	11	19.3%	
Maybe	47	43.1%	23	44.2%	24	42.1%	
No	35	32.1%	13	25.0%	22	38.6%	
How many classes would you want?**							(5.9486) 0.1141
Two	33	31.4%	19	36.5%	14	26.4%	
Three to Four	30	28.6%	13	25.0%	17	32.1%	
Five to Seven	18	17.1%	12	23.1%	6	11.3%	
Would not go to a series	24	22.9%	8	15.4%	16	30.2%	

**The participants were asked to choose all the options that applied.

Table 33 presents the importance of various healthy lifestyle factors among all participants and by age group. The majority of participants indicated healthy lifestyle factors were highly important to them, including eating healthy (72.8%), healthy weight (63.3%), physical fitness (54.3%), preventing disease (77.9%), and managing disease (76.4%). There was no significant difference in the importance of lifestyle factors by age group. Although not significant, a larger percentage of pre-seniors (64.8%) tended to feel physical fitness was highly important to them more than seniors (43.1%).

Table 33 - Importance of healthy lifestyle factors among all participants and by age groups

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How important to you is…?	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Eating healthy?							(4.3045) 0.1162*
High	83	72.8%	44	75.9%	39	69.6%	
Moderate	27	23.7%	14	24.1%	13	23.2%	
Low	4	3.5%	0	0.0%	4	7.1%	
Healthy weight?							(3.6738) 0.1593*
High	69	63.3%	40	71.4%	29	54.7%	
Moderate	36	33.0%	15	26.8%	21	39.6%	
Low	4	3.7%	1	1.8%	3	5.7%	
Physical fitness?							(5.1398) 0.0765*
High	57	54.3%	35	64.8%	22	43.1%	
Moderate	39	37.1%	16	29.6%	23	45.1%	
Low	9	8.6%	3	5.6%	6	11.8%	

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How important to you is…?	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Preventing disease?							(0.0438) 0.9783*
High	88	77.9%	44	77.2%	44	78.6%	
Moderate	19	16.8%	10	17.5%	9	16.1%	
Low	6	5.3%	3	5.3%	3	5.4%	
Managing disease?							(1.7752) 0.4116*
High	81	76.4%	41	78.9%	40	74.1%	
Moderate	20	18.9%	10	19.2%	10	18.5%	
Low	5	4.7%	1	1.9%	4	7.4%	

*Chi-square test may not be valid due to an expected cell count warning.

Table 34 presents education aspects desired by all participants and by age group. Educational aspects in order by participant desire were recipes (54.2%), handouts (42.9%), food demonstrations (40.0%), hands-on food preparation (37.5%), videos (34.4%), group discussions (31.2%), grocery store tours (19.4%), and childcare (13.6%). A significant difference was observed in participant's desire for group discussion and videos with a larger percentage of pre-seniors desiring group discussion (43.5%) and videos (46.9%), compared to seniors (19.2% and 21.3%, respectively). Although not significant (p=0.0654), pre-seniors desired recipes (61.7%) compared to seniors (46.9%).

Table 34 - Educational aspects for desired by all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How often do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Food demos?							(2.6587) 0.2647
Yes, Often	40	40.0%	21	44.7%	19	35.9%	
Yes, Sometimes	38	38.0%	19	40.4%	19	35.9%	
No	22	22.0%	7	14.9%	15	28.3%	
Hands on food preparation?							(2.9687) 0.2266
Yes, Often	39	37.5%	16	32.0%	23	42.6%	
Yes, Sometimes	41	39.4%	24	48.0%	17	31.5%	
No	24	23.1%	10	20.0%	14	25.9%	
Handouts?							(2.1977) 0.3333
Yes, Often	42	42.9%	22	47.8%	20	38.5%	
Yes, Sometimes	30	30.6%	15	32.6%	15	28.9%	
No	26	26.5%	9	19.6%	17	32.7%	

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
How often do you…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Group discussions?							(7.4058) 0.0247
Yes, Often	29	31.2%	20	43.5%	9	19.2%	
Yes, Sometimes	37	39.8%	17	37.0%	20	42.6%	
No	27	29.0%	9	19.6%	18	38.3%	
Videos?							(12.3420) 0.0021
Yes, Often	33	34.4%	23	46.9%	10	21.3%	
Yes, Sometimes	35	36.5%	19	38.8%	16	34.0%	
No	28	29.2%	7	14.3%	21	44.7%	
Recipes?							(5.4548) 0.0654
Yes, Often	52	54.2%	29	61.7%	23	46.9%	
Yes, Sometimes	27	28.1%	14	29.8%	13	26.5%	
No	17	17.7%	4	8.5%	13	26.5%	
Grocery store tours?							(3.1554) 0.2064
Yes, Often	18	19.4%	11	24.4%	7	14.6%	
Yes, Sometimes	25	26.9%	14	31.1%	11	22.9%	
No	50	53.8%	20	44.4%	30	62.5%	
Childcare available?							(0.6967) 0.7058
Yes, Often	12	13.6%	7	16.7%	5	10.9%	
Yes, Sometimes	14	15.9%	6	14.3%	8	17.4%	
No	62	70.5%	29	69.1%	33	71.7%	

Table 35 presents comfort in preparing and desire for preparation classes regarding protein foods and vegetables. The majority of participants (78.5%) indicated they were comfortable preparing protein foods. Although a larger percentage of seniors indicated they were comfortable preparing protein foods (82.8%) compared to pre-seniors (74.1%), the Chi-square test may not be valid due to an expected cell count warning. Among all participants, 42.0% indicated a desire for protein food preparation classes. There was no significant difference in participants' desire for protein food cooking classes by age group.

The majority of participants (83.8%) also indicated they felt comfortable preparing vegetables. There was no significant difference in participants' comfort preparing vegetables by age group. Similarly, among all participants, 44.2% indicated a desire for vegetable preparation classes. There was no significant difference in participants' desire for vegetable cooking classes by age group.

Table 35 - Level of comfort preparing and desire for preparation classes regarding protein foods and vegetables for all participants and by age group

	All participants		Pre-Seniors		Seniors		(Chi-square) p value
Protein foods…	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
How comfortable preparing?							(5.1160) 0.0775*
Yes	91	78.5%	43	74.1%	48	82.8%	
Maybe	18	15.5%	13	22.4%	5	8.6%	
No	7	6.0%	2	3.5%	5	8.6%	
Desire for class?							(0.9864) 0.6107
Yes	47	42.0%	25	44.6%	22	39.3%	
Maybe	26	23.2%	14	25.0%	12	21.4%	
No	39	34.8%	17	30.4%	22	39.3%	
Vegetable foods…							(1.1093) 0.5743*
How comfortable preparing?							
Yes	98	83.8%	46	80.7%	52	86.7%	
Maybe	11	9.4%	7	12.3%	4	6.7%	
No	8	6.8%	4	7.0%	4	6.7%	
Desire for class?							(1.0354) 0.5959
Yes	46	44.2%	26	49.1%	20	39.2%	
Maybe	21	20.2%	10	18.9%	11	21.6%	
No	37	35.6%	17	32.1%	20	39.2%	

*Chi-square test may not be valid due to an expected cell count warning.

Nutrition Class Topics

Table 36 presents desire for cooking classes regarding different protein foods for all participants and by age group. Protein foods cooking classes in order of participant desire were eggs (48.7%), chicken (47.9%), beef (42.0%), fish (36.1%), turkey (35.3%), dairy (34.5%), pork (31.1%), and beans (25.2%). There was no significant difference in participant's preference for protein food cooking classes by age group. Although not significant (p=0.0652), 39.0% of pre-seniors indicated an interest in pork cooking classes than seniors (23.3%).

Table 36 - Desire surrounding protein-based food classes by all participants and by age group

Protein food (check all that apply)	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
Beans							(0.8059) 0.3693
Yes	30	25.2%	17	28.8%	13	21.7%	
Beef							(0.6740) 0.4117
Yes	50	42.0%	27	45.8%	23	38.3%	

Protein food (check all that apply)	**All participants**		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
Chicken							(0.0737) 0.7861
Yes	57	47.9%	29	49.2%	28	46.7%	
Dairy							(0.0673) 0.7953
Yes	41	34.5%	21	35.6%	20	33.3%	
Eggs							(1.4157) 0.2341
Yes	58	48.7%	32	52.2%	26	43.3%	
Fish							(0.4115) 0.5212
Yes	43	36.1%	23	39.0%	20	33.3%	
Pork							(3.4005) 0.0652
Yes	37	31.1%	23	39.0%	14	23.3%	
Turkey							(0.0998) 0.7520
Yes	42	35.3%	20	33.9%	22	36.7%	

Table 37 presents interest in educational classes on healthy snacks and desserts and easy breakfast among all participants and by age group. Among all participants 53.4% indicated an interest in healthy breakfasts, 47.5% were interested in healthy snacks, and 39.0% indicated an interest in a class on healthy snacks. There was no significant difference by age group for their preferences. Although not significant (p=0.0591), a trend of pre-seniors (47.5%) were interested in healthy dessert versus seniors (30.5%).

Table 37 - Interest in nutrition topics for all participants and by age group

Class ideas (check all that apply)	**All participants**		**Pre-Seniors**		**Seniors**		**(Chi-square) p value**
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	
Healthy snacks							(2.1751) 0.1403
Yes	56	47.5%	32	54.2%	24	40.7%	
No	62	52.5%	27	45.8%	35	59.3%	
Healthy desserts							(3.5628) 0.0591
Yes	46	39.0%	28	47.5%	18	30.5%	
No	72	61.0%	31	52.5%	41	69.5%	
Easy breakfast ideas							(1.6687) 0.1964
Yes	63	53.4%	35	59.3%	28	47.5%	
No	55	46.6%	24	40.7%	31	52.5%	

Table 38 presents interest in various food and nutrition education topics for all participants and by age group. The top three food and nutrition educational topics in which participants indicated an

interest were “eating healthy at home” (57.3%), “weight management” (57.3%), “stretching your food dollar” (53.9%). A significant difference was observed by age group in interest for “eating healthy away from home” (p=0.0202) and “meal planning” (p=0.0492). A larger percentage of pre-seniors were interested in “eating healthy away from home” and “meal planning” topics (53.5% and (48.3%) compared to seniors (32.2% and 30.5%, respectively). Although not significant (p=0.0736 and p=0.0793), a trend of pre-seniors were also interested in “healthy eating at home,” (65.5%) and “lowering blood pressure” (56.9%) compared to seniors (49.2% and 40.7%, respectively). No significant differences were observed among any of the other food and nutrition topics by age group.

Table 38 – Interest in various food and nutrition education topics by age group

Would you like to go to a class about…?	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	(%)	n	(%)	n	(%)	
Healthy eating at home?							(3.2006) 0.0736
Yes	67	57.3%	38	65.5%	29	49.2%	
No	50	42.7%	20	34.5%	30	50.9%	
Healthy eating out of the home?							(5.3942) 0.0202
Yes	50	42.7%	31	53.5%	19	32.2%	
No	67	57.3%	27	46.6%	40	67.8%	
Dietary supplements?							(0.0041) 0.9489
Yes	38	32.5%	19	32.8%	19	32.2%	
No	79	67.5%	39	67.2%	40	67.8%	
Food and drug interactions?							(1.4643) 0.2262
Yes	46	39.3%	26	44.8%	20	33.9%	
No	71	60.7%	32	55.2%	39	66.1%	
Feeding babies/feeding children?							(0.1026) 0.7488*
Yes	9	7.7%	4	6.9%	5	8.5%	
No	108	92.3%	54	93.1%	54	91.5%	
Feeding teens?							(0.1707) 0.6795*
Yes	7	6.0%	4	6.9%	3	5.1%	
No	110	94.0%	54	93.1%	56	94.9%	
Mindful eating?							(0.5254) 0.4685
Yes	25	21.4%	14	24.1%	11	18.6%	
No	92	78.6%	44	75.9%	48	81.4%	
Diabetes management?							(1.9484) 0.1628
Yes	47	40.2%	27	46.6%	20	33.9%	
No	70	59.8%	31	53.5%	39	66.1%	
Weight management?							(2.0029) 0.1570
Yes	67	57.3%	37	63.8%	30	50.9%	
No	50	42.7%	21	36.2%	29	49.2%	

Would you like to go to a class about…?	All participants		Pre-Seniors		Seniors		(Chi-square) p value
	n	(%)	n	(%)	n	(%)	
Lowering blood pressure?							(3.0794) 0.0793
Yes	57	48.7%	33	56.9%	24	40.7%	
No	60	51.3%	25	43.1%	35	59.3%	
Heart healthy diet?							(1.9161) 0.1663
Yes	53	45.3%	30	51.7%	23	39.0%	
No	64	54.7%	28	48.3%	36	61.0%	
Meal planning?							(3.8699) 0.0492
Yes	46	39.3%	28	48.3%	18	30.5%	
No	71	60.7%	30	51.7%	41	69.5%	
Stretching your food dollar?							(1.0550) 0.3044
Yes	63	53.9%	34	58.6%	29	49.2%	
No	54	46.2%	24	41.4%	30	50.9%	
Cooking with less fat?							(0.2084) 0.6480
Yes	54	46.2%	28	48.3%	26	44.1%	
No	63	53.9%	30	51.7%	33	55.9%	
Cooking with less salt?							(2.1721) 0.1405
Yes	35	29.9%	21	36.2%	14	23.7%	
No	82	70.1%	37	63.8%	45	76.3%	
Cooking with less sugar?							(0.7058) 0.4008
Yes	42	35.9%	23	39.7%	19	32.2%	
No	75	64.1%	35	60.3%	40	67.8%	
Cooking for one or two?							(0.4132) 0.5204
Yes	55	47.0%	29	50.0%	26	44.1%	
No	62	53.0%	29	50.0%	33	55.9%	
Cooking for a big family (6 and above)?							(2.0112) 0.1561
Yes	15	12.8%	10	17.2%	5	8.5%	
No	102	87.2%	48	82.8%	54	91.5%	
How to cook foods you get from the food pantry?							(0.0717) 0.7889
Yes	51	43.6%	26	44.8%	25	42.4%	
No	66	56.4%	32	55.2%	34	57.6%	
How to use leftovers to make other meals?							(0.0685) 0.7936
Yes	37	31.6%	19	32.8%	18	30.5%	
No	80	68.4%	39	67.2%	41	69.5%	
How to prepare and store foods safely?							(0.0237) 0.8776
Yes	31	26.5%	15	25.9%	16	27.1%	
No	86	73.5%	43	74.1%	43	72.9%	
Reading food labels?							(0.7058) 0.4008
Yes	26	22.2%	11	19.0%	15	25.4%	
No	91	77.8%	47	81.0%	44	74.6%	
Increasing physical activity?							(1.0311) 0.3099
Yes	49	41.9%	27	46.6%	22	37.3%	
No	68	58.1%	31	53.5%	37	62.7%	
Food expiration?							(1.6930) 0.1932
Yes	32	27.4%	19	32.8%	13	22.0%	
No	85	72.7%	39	67.2%	46	78.0%	

*Chi-square test may not be valid due to an expected cell count warning.

CHAPTER V

DISCUSSION

Demographics

Gender

Of the 119 participants in this study, 59 participants were between 50-64 years of age (pre-seniors) and 60 were 65 years and above (seniors). Of those who reported their gender, 78 reported their gender as female (70.3%) and 33 reported their gender as male (29.7%). The higher percentage of females is consistent with research indicating food insecure individuals are more likely to be females living alone or single mothers compared to males living alone or single fathers (USDA ERS, 2018). The larger number of females may also reflect that women are typically responsible for food related activities in the home and thus more females may frequent the food pantry and thus completed the survey. Another potential reason for the higher percentage of females is that there are a greater number of females compared to males in the older adult population (Department of Health and Human Services, n.d.).

Ethnicity/Race

Figure 1 indicates the two groups sampled have some similarities and differences to the Stillwater and general Oklahoma population but overall the participants were Caucasian (United States Census Bureau, 2017b). Both age groups had a higher percentage of Native Americans than

Stillwater's population (4.9%) and were more representative of Oklahoma as a whole. Oklahoma has a 9.2% Native American population while the pre-senior group had 8.9% and the senior group had 7.3% (United States Census Bureau, 2017b). In addition, both age groups had a higher percentage of African Americans than either Oklahoma or Stillwater's population (United States Census Bureau, 2017b). The sample in this study also had few Hispanics (n=5) and Asians (n=1) in comparison to Oklahoma as a whole (United States Census Bureau, 2017b).

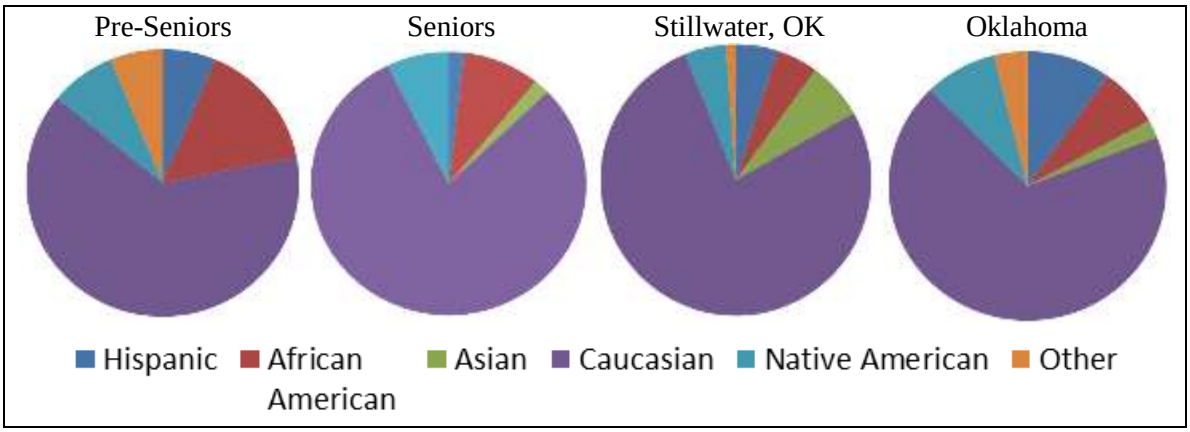

Figure 1 – Participants Demographics Compared to Stillwater & Oklahoma Populations

Higher rates of food insecurity have been associated with minority groups. One study noted 26% of African American households struggle with food insecurity as compared to White non-Hispanics at 11% (Feeding America, 2017). A 2000-2010 national study that looked at food insecurity between races found American Indians/Alaskan Indians were 20% more likely to experience food insecurity compared to Caucasians and Hispanics, whereas African Americans were 50% more likely to experience food insecurity compared to Caucasians (Jernigan, Huyser, Valdes, & Simonds, 2017). One study conducted in Oklahoma found that one in every four American Indians was food insecure (Sobol, 2018).

Education

In the current study, 78.2% of participants reported having a high school degree or higher, which is slightly lower than the 87.3% of Oklahomans reported to have a high school degree or higher, from the 2012-2016 census (United States Census Bureau, 2017b). As the study population was older people, it is notable that in 2015, a slightly lower percentage of American seniors (82.8%) reported completing high school or higher education compared to general adults (88%) (United States Census Bureau, 2017b; Ryan, & Bauman, 2016). One study found that those who did not have a high school diploma were 40% more likely to be food insecure compared to those who had completed high school (Jernigan, et al, 2017). As most participants (72.3%) indicated Stillwater, Oklahoma was their home and Stillwater is location of the Oklahoma State University main campus. This may explain the higher participant education level compared to the average food pantry guest (United States Census Bureau, 2017b).

Poverty

In this current study, the majority of the participants were below the federal poverty level for a single individual which is $12,140 (OKpolicy.org, n.d.). More of the study population could be below poverty if another individual lived with them because 22% were between $12,000-16,000 which is below the federal poverty level for two individuals (Cullison, 2017). As 47% indicated that the food provided from the food pantry was feeding more than one individual; probably all the food pantry guests were experiencing some level of poverty. In 2016, 16.3% of Oklahomans were below poverty level and, in this study, a higher percentage of food pantry guests were below poverty levels as compared to the state average (Cullison, 2017).

Employment

In the sample studied, only 11 out of 111 participants indicated they were employed either part-time or full-time. Employment status influences one's ability to have the resources to buy food and pay for bills. One study showed the prevalence of food insecurity and the national unemployment rate showed a similar trend (Nord, Coleman-Jensen, & Gregory, 2014). Estimates have been made that for one percentage point of unemployment rate there is an associated 0.5 percentage increase in prevalence of food insecurity (Nord, et al., 2014). As the sample is older, the participants may not be working for various reasons including retirement, physical handicaps, and possibly the employers are not interested in hiring older employees.

Food Security Status

This study indicated that over a third (35%) of participants were classified as very low food secure and almost two-thirds (63%) were food insecure, but there was no significant difference in food security by age category. This may be due to numerous factors. One such factor could the decreased resources available for those under the age of 65, due to not being eligible for social security or Medicare. One study found that among 15 age group divisions starting at 21 years of age, there was a significant difference between the percentage of those who "fear of running out of food" and those who had "no fear of running out of food". In comparing those who were 50-64 to those 65 and above, there was a higher percentage of pre-seniors who were fearful of lack of food than the senior group (Vaccaro, & Huffman, 2017). Though not significant in this study, individuals may perceive a higher risk of lack of food in the younger age groups.

Food Assistance Programs Use

As shown in this study, only four people indicated eating senior meals and one indicated utilizing the Senior Farmers Market. Overall, the senior specific programs do not appear to be utilized but

41% of individuals indicated they used SNAP. As there is an income requirement for SNAP, not all food pantry guests are necessarily able to participate. Community/church meals are more frequently utilized by pre-seniors but 20% of the total sampling reported partaking in community/church meals. Overall, as noted above, the pre-senior group was more concerned about having adequate food, and in this study, it was noted that the pre-seniors also utilized more resources to attain food.

The participants in this survey almost entirely (95%) indicated that the food pantry gave them more independence by helping them to stay in their homes. This is very important because this older population greatly values independence. One study indicated that 87% of seniors wanted to remain living in their current location and 71% of pre-seniors wanted to age in place (AARP, n.d.). Financial and physical resources of food are major consideration in whether or not an individual can remain their home.

Economic and lifestyle adjustments are challenges that individuals struggling with food security face. Almost half of the participants reported regularly stretching meals (48%) or eating smaller meals (41%). A quarter of the study participants reported regularly skipping meals. These coping mechanisms for food insecurity may be helping them be able to eat for more days; however, these methods could be decreasing their overall nutritional status.

Living Situation

Marital Status

Among all participants 12.6% were never married, 21.6% were married, and 65.8% were divorced, separated, or widowed. Specifically, among seniors, 23.64% reported they were married. Looking at census data from 2016, 57.8% of adults, 65 years of age and older, were married which is more than double the percent of seniors who reported being married in this

study (United States Census Bureau, 2017a). Other U.S. census data, from 2015 with seniors, found that there were a lower percentage of women living with their spouse compared to men, respectively 70% to 45% (Department of Health and Human Services, n.d.). This is a concern because women living alone are at a higher risk for food insecurity than males (USDA ERS, 2018).

Adults and Children Living with the Participant

One report indicated that not only was marital status a risk factor of food insecurity but seniors living alone were twice as likely to be hungry compared to married seniors (Ziliak et al., 2014). In this study, almost half (49%) indicated they had no other adults living with them. However, around 23% indicated they had children (under the age of 18) living with them. These individuals are not only taking care of themselves but the future generations of America. The percentage is consistent with data from Oklahoma that among the elderly 19% of them are taking care of children (RFBO, n.d.a).

Living Situation and Social Support

Living situations determine available resources and scope of support systems. Social support impacts nutrition as loneliness is risk factor of malnutrition in the elderly (Ramic et al., 2011). Social isolation, loneliness, and neglect from family have been seen to negatively influence nutrition status (Ramic et al., 2011). In this study, almost half (48.8%) of participants living without any other adults indicates a potential lack of social interaction and support. This is further emphasized as only 17.2% of the participants indicated they had many family members or friends nearby who could assist them in their life. The majority of participants indicated they lived in an apartment, house, or mobile home (92.8%). Only three participants indicated they lived in retirement centers which may increase social interaction; two individuals indicated they were homeless. This indicates most of the participants were living independently and thus were

responsible for their food intake. In the sample, around 50% percent indicated that they ate meals alone most days and that 20% felt lonely most days.

Ability and Resources

Comfortable with meal preparation

Less than 20% of participants indicated that most days they needed assistance with shopping and preparing meals. One in five individuals was getting help from family and friends with shopping and preparing meals which indicates a potential level of dependence. Thus, if friends or family were unable to assist, this could decrease overall nutrition for some of the guests that day. Overall, the results indicate that the majority of the participants were functionally independent and capable of food preparation. Concerning groups being comfortable with menu planning there was a significant ($p=0.0391$) difference among the groups: 63% of pre-senior compared to seniors at 41% respectively. Overall, half of the individuals indicated feeling comfortable often with reading and understanding food labels, planning menus, writing a shopping list, and selecting healthy foods at the grocery store. Though there are some who have a high level of comfortabilities, other food pantry guests still have uncertainty or do not feel comfortable at all times which could be an opportunity for education.

Physical resources

The majority of individuals had running water, electricity, space, and cooking equipment to prepare meals at home. There was a significant difference ($p=0.0258$) between the pre-seniors and seniors in regards to the percentage who did or did not have a microwave although the Chi-square test may be not valid due to unexpected cell count. Thirteen percent of pre-seniors did not own a microwave while only 1% of seniors did not have a microwave. Overall all the resources were available to 80% or greater for the entire sample, besides smart phones that were available

to about half of the sample. This indicates that physical resources are not a significant challenge in regards to food insecurity among this sample.

Overall Health

Health

There was a significant difference between the pre-senior group with a 17% to 2% in the senior group who indicated they often had issues with taste or smell. A variety of health reasons for why taste and smell are issues including conditions such as obesity, diabetes, poor nutrition, polypharmacy, and high blood pressure (Huffman, 2002; Johns Hopkins, n.d.). The seniors may not indicate having as many problems with taste or smell because of continued prolonged problems and are no longer aware.

Dietary intake

In this study, around 25% seldom, if ever ate breakfast, 10% did not eat lunch and 5% did not eat dinner regularly. One cohort study indicated that adults who skipped breakfast showed a 21% higher risk for type 2 diabetes which could be related to weight gain from increased food intake at the next meal (Mekary, Giovannucci, Willett, Van Dam, & Hu, 2012). Diabetes prevalence in the senior population is estimated to be around 25.2% or 12 million seniors, which includes diagnosed and undiagnosed diabetes and incidence of diabetes in this study was 34.5% (American Diabetes Association, 2018). There could be numerous factors for why people skip meals such as lack of financial resources and ability to acquire the food since low socio-economic status is a cause of malnutrition in the elderly (Cook & Frank, 2008). Not only is the older population more vulnerable to inadequate nutrition but under-nutrition in adults over 70 years also increases the risk of disease and hospitalization (Mowe, Bøhmer, & Kindt, 1994). Skipping meals may be seen as unavoidable because of circumstances, but over half (54%) of the participants were interested

in a class about “Stretching your food dollar.” This indicates an interest in how to have access to more food given resource constraints.

Without intentionally trying, over 40% of the participants indicated a food intake change over the past three months, 35% was a decrease in food. Another 36% of individuals indicated unintentional weight loss, a higher incidence than the 13% found in a study of older adults (Ruscin, Page, Yeager & Wallce 2005). This is of great concern as unintended weight loss in seniors is associated with increased morbidity and mortality (Gaddey and Holder, 2014). There are three main risk factors for weight loss in the older adult population: physiological factors, psychological factors, and social factors (Stajkovic, Aitken & Holroyd-Leduc, 2011). One of the most common causes of unintentional weight loss in the elderly is from nonmalignant diseases (Gaddey and Holder, 2014). Nutrition is important to not only manage disease but also to help prevent diseases that could have other harmful effects such as weight loss.

Body Mass Index (BMI)

Through a recent meta-analysis of 32 cohort studies of older community dwelling people the lowest mortality risk was associated with a BMI of 24 to 31 (Winter, Maclnnis, Wattanapenpaiboon & Nowson 2014). This indicates that this range may be a healthy range for the adults over the age of 65 years. Almost a third of the seniors in this study had a BMI between 25-29.9 and about 10% were underweight. Underweight in the elderly can lead to muscle loss or fat mass due to sarcopenia or cachexia (Kaneko et al., 2016). Sarcopenia has been seen to have adverse outcomes including poor quality of life, disability, and even death in some cases (Kaneko et al., 2016). Obesity in this sample was around 38% percent, which is slightly higher than the findings from the National Health, and Nutrition Examination survey of 2007-2010, which indicated one-third of the senior population were obese (Fakhouri, Ogden, Carool, Kit & Flegal, 2015). In the adult population in Oklahoma obesity rates are around 36.5% (Robert Wood

Johnson Foundation, 2017). A continual increase in obesity over time, coupled with lower education status and income have been reported to be inversely related to obesity (United Health Foundation, n.d.). Obesity can cause many health consequences including cardiovascular disease, type 2 diabetes, osteoarthritis, body pain, and mortality (Centers for Disease Control and Prevention, 2018b).

Disease Status

One study found that around 46% of older adults have 2-3 chronic health conditions and around 16% have 4 or more (Ward & Schiller, 2013). Participants in this study reported having numerous health conditions. High blood pressure is a risk factor for stroke, heart disease, eye problems, kidney failure and other health problems, and was the highest condition reported by 59% of participants (National Institute on Aging, n.d.). In this study, arthritis was the second most common condition measured at 57%. Half of the senior population in America is estimated to have arthritis, and it is slightly more prevalent among women than men (HealthinAging.org, 2016). Arthritis is considered to be leading cause of disability in the U.S. which decreases one's ability of daily functions (HealthinAging.org, 2016). Dental problems and fatigue were both greater than 40% in this sample which could both be negative indicators for ability and desire to make food or consume food. Depression was around 39% in this study which is higher than the estimated percentage of depression among older adults which ranges from 1-13.5% (CDC, 2017a). Having other conditions can increase depression, and food insecurity, which has been linked with higher mental health issues (Muldoon et al., 2013). In Oklahoma, 14.3% of adults are estimated to have diabetes (American Diabetes Association, n.d.). Prevalence of diabetes is estimated to be around a quarter of the senior population but in this study the percentage was higher at 34% (American Diabetes Association, 2018). This 34% does not account for those who are undiagnosed which in some estimates could be around another 24% (American Diabetes Association, 2018).

Dietary Status

The reported special dietary needs seemed to be similar to disease states reported. For example around 36% as indicated needing by low sugar diet which is similar to the 34% who indicated having diabetes. Low sodium was the next highest dietary need at 32%, which could be related to trying to decrease high blood pressure which was reported by 59% in this sample. While 41% indicated on most days and 41% indicated on some days that they had the food they needed to make healthy meals, the food pantry guest's definition of health and the recommended guidelines may differ.

Overall, dietary status is poor within this sample, as most of the individuals are not consuming the lowest recommended amount of vegetables and fruits. Vegetable and fruits are high in fiber, vitamins, and minerals, which are important in various processes within the body. Other studies have also found inadequate amounts of micronutrients in comparison to the recommended dietary allowance in the elderly food insecure population (Gundersen & Ziliak, 2014; Jung & Frongillo Jr, 2001; Rose & Oliveira, 1997). Studies have indicated that food pantries do not provide adequate amounts of fruits, vegetable, and dairy products for the recommended daily allowance (Akobundu, Cohen, Laus, Schulte, & Soussloff, 2004; Simmet, et al., 2017). Inadequate resources could be one of the leading reasons for inadequate fruit and vegetable consumption but overall in the United States only 12.2% of adults consume the recommended amounts of fruits and only 9.3% consume recommended amounts of vegetables (CDC, 2018a). Both females and males in this study reported consuming more fruits and vegetables for their recommended amount than the United States average.

Nutrition Interest and Educational Format

Education Format

There was an overall lack of definite interest in food and nutrition education with only 18% indicating “yes” and 46% indicating “maybe.” These results suggest that the nutrition education if interesting enough could help lure a significant number as almost half (46%) were unsure of how interested they were. Most individuals seemed to prefer a shorter series as 31% reported interest in 2 classes, 29% indicated interest in 3-4 classes, and only 17% indicated interest in 5-7 classes. Thus, after four classes only a small percentage would be interested and committed to attend.

Overall, the food pantry guest seemed to desire shorter classes as the highest percentage of participants indicated a preference for 30-minute classes (49%). In addition, participants desired classes to be earlier (morning or early afternoon) on a weekday such as Wednesday followed by Tuesday, and Monday. In addition, there were various educational aspects participants indicated they wanted often such as recipes (54%), handouts (43%), food demos (40%), hands on food preparation (38%), and group discussions (31%). More pre-seniors indicated interest in group discussions and videos was found compared to seniors. This indicates pre-seniors may desire more variety and interaction while learning compared to seniors.

Assessing the importance of various health aspects can provide programming direction. When participants were asked to indicate the importance of various health aspects, the aspects in order of high importance were “preventing disease” (78%), “managing disease” (76%), “eating healthy” (73%), “healthy weight” (63%), and “physical fitness” (54%). Thus, healthful eating, particularly related to disease prevention and management seem to be of particularly high importance.

Interest in Specific Food Classes

As far as protein foods were concerned, participants indicated interest in cooking classes about, eggs (49%), chicken (48%), beef (42%), fish (36%), turkey (35%), dairy (34%), pork (31%), and beans (25%). Eggs and chicken are cheaper animal sources of protein, which could be one of the reasons why participants wanted to learn more about how to cook with them. Despite the fact that Oklahoma is a land-locked state, over one-third of individuals showed some interest of learning to cook with fish. This could be because canned tuna is a cheaper protein or that local fishing is another food source.

Other class ideas that seemed somewhat popular among participants were "easy breakfast ideas" (54%), "healthy snacks" (47%), and "healthy desserts" (39%). Though around one quarter of the sample indicated they skipped breakfast, it is interesting to note that over half the participants desired a class on easy breakfast ideas. All three of these ideas for classes revolve around recipes which were the highest reported class format desired. This result is consistent with a survey of food pantry guests which indicated "making fast and easy recipes" was the top-class choice the participants wanted to attend (Wood et al., 2007).

Food and Nutrition Educational Topics

Two educational topics that pre-seniors were significantly more interested in than seniors were "healthy eating out of the home," 53% to 32%, respectively, and "meal planning," 48% to 31%, respectively. These data indicate pre-seniors may eat outside the home more often and potentially could use assistance on how to plan and prepare meals at home.

The food and nutrition education classes in which the food pantry guests indicated higher interest can be separated into two main categories: "living a healthy life" within their circumstances and "diet related to health and disease." Those classes associated with "living a healthy life" include

healthy eating at home (57%), weight management (57%), stretching your food dollar (54%), cooking for one or two (47%), how to cook food from the food pantry (44%), healthy eating out of the home (43%), and increasing physical activity (42%). Although less than half of participants indicated an interest in learning "how to cook food from the food pantry," one study reported less than half of food pantry guests knew how to prepare all the foods given to them by food pantries (Greger et al., 2002).

Classes in the category of "diet related to health and disease" include: weight management (57%), lowering blood pressure (49%), cooking with less fat (46%), heart healthy diet (45%), increasing physical activity (42%), diabetes management (40%), and food and drug interactions (39%).

Overall a lack of interest was seen not only in a desire for classes but also for various topics. Some of the topics that less than 15% indicated an interest in attending were "feeding babies/feeding children, feeding teens," and "cooking for a big family (6 and above)." This indicates a large percentage were probably not feeding minors or big families and/or was already comfortable with these topics.

As one can note, in a couple of the categories, pre-seniors indicated a higher level of interest to learn and need help in various areas. This could be due to the potential decrease resources through Medicare and other senior specific assistance, or it could be a difference of perception. One study conducted in-depth qualitative interviews with 13 community dwelling (defined as individuals over the age of 60 who live independently) seniors in an effort to define perceptions of weakness and ageing (Rush, Watts, & Stanbury, 2011). This study found older people defined weakness as an inability that is associated with ageing; this could indicate older adults may be less willing to acknowledge their need for help because ageing is perceived negatively (Rush et al., 2011). Another article looking at older individual's perception of themselves found participants had a negative response to materials overly targeted towards older people and instead

preferred problem-specific or generic materials (Stead, Wimbush, Eadie, & Teer, 1997). In making education material for older individuals, prudence in choosing topics that are of interest but do not make the individual feel as if the material only applies to older individuals because this could negatively impact attendance to nutritional classes.

CHAPTER VI

CONCLUSION

Food insecurity can affect overall health physically, socially, and mentally. Oklahoma, in particular, is in the top ten states for food insecurity. Food insecurity negatively impacts older adults. Older adults are also at risk for food insecurity and malnutrition. Our Daily Bread Food and Resource Center guests, 50 years of age and older were surveyed to assess overall food security; dietary and health status, and educational preferences and desires. Comparisons were also made between participants 50 to 64 years of age (pre-seniors) and participants 65 years of age and older (seniors). This study indicated challenges with lower educational background, poor dietary status, lack of financial resources, and concern for daily needs that these individuals are facing on a regular basis.

Although there were few significant differences between pre-seniors and seniors, overall the results of this study indicate these two groups may have similar struggles. Pre-seniors potentially have more difficulty dealing with food insecurity due to their ineligibility for senior food assistance programs, social security, and Medicare. More research should be conducted with a larger sample size to further investigate the potential differences between food security in the pre-senior and senior groups across Oklahoma to determine if they are facing the same struggles. This research would be of great benefit in helping Americans improve the quality of life of the increasing older population.

Overall, few indicated a definite interest in food and nutrition education; however, almost half indicated they may be interested. Almost half participants indicated interest in education lasting 30 minutes, occurring in the morning or early afternoon and on weekdays (Tuesday and Wednesday). Educational aspects most desired were recipes, handouts, and food demonstrations. The majority indicated health was highly important to them including eating healthy, preventing disease, and managing disease. The top three educational topics participants were interested in healthy eating at home, weight management, and stretching the food dollar which reflects participants desire to utilize their resources within their circumstances and nutrition information related to disease. Food insecurity has been associated with poor diet and health. Though there is a lack of interest seen in the participants regarding nutrition education, there was a higher interest in eating healthy within their budget constraints and disease prevention and management were noted of higher interest. Overall, one should focus on developing materials that targets classes to the audience's interest in order to attract participants. In this study, their practical needs such as assistance with making money stretch further and helping manage their diseases would be beneficial classes. Focusing classes on daily life skills that will help them cope with food insecurity and their health may be something pre-seniors and seniors across the nation desire, but more research is needed to indicate if this study results are more wide-spread. Implementing and evaluating some of the class ideas for this older population and assessing overall participation would be a future step to implement and gain a further understanding of this population. Continual evaluation of the programs for the older population will help implement a better approach to assist them in the aging process.

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APPENDICES

Appendix A: Introductory Script

Recruitment Script

Hello, my name is Rachel and I am a graduate student studying nutrition at Oklahoma State University and this is Janice, a professor at Oklahoma State University.

We are doing a survey project with food pantry guests, 50 years of age and older, to determine the food and nutritional desires and needs regarding educational materials for older adults who obtain food from food pantries.

We believe this survey will provide valuable insight to positively impact older adults who face food insecurity through nutrition educational materials in Oklahoma and findings will not only benefit Oklahomans, but also those across the country.

Participation in this project involves completing a survey *(hold up program evaluation survey)*. We would like to point out:

- Your name is not recorded on the survey.
- You may skip any question you do not wish to answer.
- We estimate it will take you twenty to thirty minutes to complete this survey.
- There are no risks associated with this project greater than those ordinarily encountered in daily life.
- Your participation in this project is voluntary. Turning in your completed program evaluation survey in the box provided indicates your willingness to participate in this project.
- Individuals who complete the survey will be provided with $20 cash.

If you would be interested in participating in this project, please come over to (area indicated) where we will assist you in completing the survey.

Appendix B: Participant Information Form

Nutritional Sciences Department

PARTICIPANT INFORMATION FORM

Assessing Adult Food Pantry Clients', 50 Years of Age and Above, Food and Nutrition Knowledge, Desires, and Needs

We would like to ask you questions about food and nutrition. Rachel Sheppard and Dr. Janice Hermann in the Nutritional Sciences Department at Oklahoma State University are doing this study. Participation in the study is voluntary. There is no drawback for not doing the study. You are free to stop doing the study at any time.

This study involves completing a survey which will take around 20 minutes.

Compensation:
You will receive $20 in cash for doing the survey.

Confidentiality:
The information you give will be anonymous. This means your name will not be linked to the data in any way. The researchers will not be able to remove your data from the dataset once your participation is complete. The surveys will be stored in a locked cabinet in a locked office. All study results will be on group findings and no one person will be singled out.

Contacts and Questions: If you have questions about the study, please contact Janice Hermann, Ph.D., RD/LD College of Human Sciences, Department of Nutritional Sciences, Oklahoma State University, Stillwater OK 74078, 405-744-4601, janice.hermann@okstate or Rachel Sheppard B.S. Nutritional Sciences Graduate Student, Oklahoma State University, Stillwater, OK 74078 918-543-5454, rachel.sheppard@okstate.edu. If you have questions about your rights as a research volunteer, please contact the OSU IRB at (405) 744-3377 or irb@okstate.edu.

If you agree to participate in this survey, please put your completed survey in the box.

Appendix C: Survey Instrument

Survey of Food Pantry Guests, 50 Years of Age and Older

I. Food Pantry:

1. Do you think the food pantry food helps you to continue to live at home?
   _____ Yes
   _____ No
   _____ Do not know

2. How many people eat the food you get from the food pantry? _____

II. Food and Nutrition Education Interests:

1. Are you interested in attending any food and nutrition education classes?
   _____ Yes
   _____ Maybe
   _____ No

2. How long would you like a single education class to last?
   _____ 30 minutes
   _____ 45 minutes
   _____ 1 hour
   _____ Other _____

3. Which time would be best for an educational class to be offered (check all that apply)?
   _____ Morning
   _____ Early afternoon
   _____ Late afternoon
   _____ Evening

4. What day(s) would be best for you (check all that apply)?
   _____ Monday
   _____ Tuesday
   _____ Wednesday
   _____ Thursday
   _____ Friday
   _____ Saturday

5. Would you like to come to a series of classes about food and nutrition?
   _____ Yes
   _____ Maybe
   _____ No

6. If there was an educational series how many classes would you want to come to?

_____ 2
_____ 3-4
_____ 5-6
_____ 7+
_____ I would not come to a series.

7. I feel comfortable preparing...	Yes	Maybe	No
Protein foods?			
Vegetables?			
8. I would like a class about preparing...	**Yes**	**Maybe**	**No**
Protein foods?			
Vegetables?			

9. Would you like a class about preparing (check all that apply)?

_____ Beans (black, kidney, navy, pinto)
_____ Beef
_____ Chicken
_____ Eggs
_____ Fish
_____ Pork
_____ Turkey
_____ Dairy foods

10. Would you be interested in learning how to make (check all that apply)?

_____Healthy snacks
_____Healthy desserts
_____Easy breakfast ideas

11. How important to you is...	High	Moderate	Low	None
Eating healthy?				
Healthy weight?				
Physical fitness?				
Preventing disease?				
Managing diseases?				

12. In education classes would you like...	Yes, Often	Yes, Sometimes	No
Food demos?			
Hands on food preparation?			
Handouts?			
Group discussions?			
Videos?			
Recipes?			
Grocery store tours?			
Childcare available?			

13. Would you like to go to a class about:	
_____	Healthy eating at home
_____	Healthy eating away from home
_____	Dietary supplements
_____	Food and medication interactions
_____	Feeding babies/feeding children
_____	Feeding teens
_____	Factors affecting eating
_____	Eating with diabetes
_____	Maintaining a healthy weight
_____	Lowering blood pressure
_____	Heart healthy diet
_____	Meal planning
_____	Stretching your food dollar
_____	Cooking with less fat
_____	Cooking with less salt
_____	Cooking with less sugar
_____	Cooking for one or two
_____	Cooking for a big family (6 and above)
_____	How to cook foods you get from the food pantry
_____	How to use leftovers to make other meals
_____	How to prepare and store foods safely
_____	Reading food labels
_____	Increasing physical activity
_____	Dates on foods
_____	Other topics (Please list):

On the list above circle the top two classes you would like?

III. Dietary:

1. How many cups of fluid do you drink in a normal day?_____

2. How many cups of fruits do you eat in a normal day?_____

3. How many cups of vegetables do you eat in a normal day? _____

4. Do you have any special dietary needs? [Check all]
   _____ Low fat
   _____ Low sodium
   _____ Low sugar
   _____ Food allergy _____
   _____ Other _____

5. How often do you...	Seldom, If Ever	Some Days	Most Days	Do Not Know
Eat breakfast?				
Eat lunch?				
Eat dinner?				
Eat snacks?				
Prepare meals at home?				
Have the food you need to make healthy meals?				
Eat meals alone?				
Eat meals with others?				
Eat fast food?				
Feel lonely?				
Get help shopping for food from family or friends?				
Get help preparing meals from family or friends?				

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6. Do you...	Yes, Often	Yes, sometimes	No
Feel comfortable reading and understanding food labels?			
Get foods from the pantry that you do not know how to prepare?			
Feel comfortable planning menus?			
Feel comfortable writing a shopping list?			
Feel comfortable selecting healthy foods at the grocery store?			
Have problems grocery shopping (energy, driving, walking, etc.)?			
Have problems preparing meals (energy, seeing, standing, walking, strength, ok using your hands)?			
Have problems eating (chewing, swallowing, using your hands)?			
Have problems with taste or smell?			

7. Do you...	Yes	No
Have running water?		
Have a refrigerator?		
Have a freezer?		
Have an oven?		
Have a microwave?		
Have a crock pot?		
Have a stove top?		
Have enough space to store frozen food?		
Have enough space to store refrigerated food?		
Have enough space to store dry food?		
Have the right tools to prepare meals at home?		
Have the cooking skills to prepare meals at home?		
Have a smart phone?		
Have electricity?		

8. If you do not have enough food, do you ever...	Yes, Often	Yes, Sometimes	No
Eat smaller meals?			
Skip meals?			
Stretch meats? (make soups or casseroles; add rice or noodles)			
Eat expired foods?			
Eat foods that may have been stored for more than 4 days?			
Eat community meals?			
Get help with food from family or friends?			

IV. Health status: Mark what best describes you.

1. What is your height? _____ feet _____ inches

2. What is your weight? _____ pounds

3. Without wanting to...	No	Yes, Decreased	Yes, Increased	Do Not Know
Has your food intake changed over the past 3 months?				
Has your weight changed over the past 3 months?				

4. How many medications on a regular basis do you take?_____

5. In a normal week (7 days) how often do you do activity long enough to work up a sweat (heart beats rapidly)?
   _____ Often
   _____ Sometimes
   _____ Rarely or Never

6. Do you have any of these conditions [Check all]?
   _____ Arthritis
   _____ Cancer
   _____ Dental problems
   _____ Depression
   _____ Diabetes
   _____ Fatigue
   _____ Food allergies_____
   _____ Heart Disease
   _____ High blood pressure
   _____ Osteoporosis

V. Food Security: Mark what best describes you. 6

In the last 12 months...	Often True	Sometimes True	Never True	Do Not Know
1. The food I bought just didn't last, and I didn't have money to get more.				
2. I couldn't afford to eat balanced meals.				

In the last 12 months...	Yes (answer question 4)	No (skip question 4)
3. Did you ever cut the size of your meals or skip meals because there wasn't enough money for food?		

Answer question 4, if you answered Yes on question 3.	Almost Every Month	Some Months, but Not Every Month	Only 1 or 2 Months	Do Not Know
4. How often did this happen?				

In the last 12 months...	Yes	No	Do Not Know
5. Did you ever ***eat less than you felt you should*** because there wasn't enough money for food?			
6. Did you ever ***eat less than you felt you should*** because you couldn't get the food you needed even though you had money for food?			
7. Did you ever ***eat less than you felt you should*** because you were unable to prepare a meal even though you had food in the house?			
8. Did you ever ***eat less than you felt you should*** because you didn't feel up to cooking?			
9. Were you ever ***hungry but didn't eat*** because there wasn't enough money for food?			
10 Were you ever ***hungry but didn't eat*** because you couldn't get the food you needed even though you had money for food?			
11 Were you ever ***hungry but didn't eat*** because you were unable to prepare a meal even though you had food in the house?			
12 Were you ever ***hungry but didn't eat*** because you didn't feel up to cooking?			
13 Were you ever unable to ***eat the right food for your health*** because you couldn't afford them			
14 Were you ever unable to ***eat the right food for your health*** because you couldn't get the food you needed even though you had money for food?			
15 Were you ever unable to ***eat the right food for your health*** because you were unable to prepare a meal even though you had food in the house?			
16 Were you ever unable to ***eat the right food for your health*** because you didn't feel up to cooking?			

VI. Tell us about you: Mark what best describes you.

1. What is your age? _____

2. What is your gender?
   _____ Male
   _____ Female

3. Are you Hispanic?
   _____ Yes
   _____ No

4. What is your race? [Check all that apply]
   _____ African American
   _____ Asian
   _____ Caucasian or White
   _____ Native American
   _____ Other _____

5. What is your marital status?
   _____ Never married
   _____ Married
   _____ Divorced/Separate Widowed

6. Are there any foods you do not eat because of your culture or faith?
   _____ No
   _____ Yes_____

7. What is your highest level of education?
   _____ Some high school
   _____ High school graduate
   _____ Some college/associates degree
   _____ Bachelor's degree
   _____ Some graduate school or higher

8. Are you currently employed?
   _____ No
   _____ Yes, part time
   _____ Yes, full time

9. What town or city do you consider your home?
   _____

10. What is your current living situation?
    _____ Apartment /House / Mobile home
    _____ Homeless
    _____ Local shelter
    _____ Retirement center
    _____ Other_____

11. **Not including yourself**, how many adults (18 years or older) live with you? _____

12. How many children (younger than 18 years) live with you? _____

13. How many family members or friends do you have nearby that can help you?
    _____ None
    _____ Very few
    _____ Many

14. What food assistance programs do you use? [Check all that apply]
    _____ Community/Church Meals
    _____ Food Distribution Program on Indian Reservations
    _____ Food Pantries
    _____ Food Stamps/ SNAP
    _____ Home Delivered Meals
    _____ Senior Farmers Market
    _____ Senior Meals
    _____ Other_____

15. What range is your annual household income?
    _____ Less than $12,000
    _____ $12,000 - $16,000
    _____ $16,001 - $21,000
    _____ $21,001 - $25,000
    _____ $25,001 - $29,000
    _____ Over $29,000

Appendix D: Oklahoma State University Institutional Review Board for Human Subjects Approval

Oklahoma State University Institutional Review Board

Date:	06/20/2018
Application Number:	HS-18-35
Proposal Title:	Assessing Adult Food Pantry Clients', 50 Years of Age and Above, Food and Nutrition Desires and Needs
Principal Investigator:	Rachel Sheppard
Co-Investigator(s):	
Faculty Adviser:	JANICE HERMANN
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 223 Scott Hall (phone: 405-744-3377, irb@okstate.edu).

Sincerely,

Hugh Crethar, Chair Institutional Review Board

VITA

Rachel Sheppard

Candidate for the Degree of

Master of Science

Thesis: ASSESSING THE FOOD AND NUTRITION DESIRES AND NEEDS OF FOOD PANTRY GUESTS AGED 50 YEARS AND OLDER

Major Field: Nutritional Sciences

Biographical:

Education:

Completed the requirements for the Master of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in May 2019.

Completed the requirements for the Bachelor of Science in Dietetics and a Minor in Biomedical Sciences at Missouri State University, Springfield, Missouri in 2017.

Experience:

Work Experiences:

Graduate Research Assistant at Oklahoma State University Stillwater, OK January 2018-Present

Graduate Teaching Assistant at Oklahoma State University Stillwater, OK June 2018-August 2018

Nutrition Room Service Representative at Saint Francis Hospital Tulsa, OK June 2017-January 2018

Health Market Clerk at Hy-Vee in Lenexa, KS June 2015-June 2015

Professional Memberships:

Academy of Nutrition and Dietetics: 2017-Present